

**Graymont Western U.S., Inc.
Cricket Mountain Project, Utah**

**Notice of Intention to Amend Mining Operations
Fingers Quarry**



GRAYMONT

**Graymont Western, U.S., Inc.
3950 South 700 East
Suite 301
Salt Lake City, Utah 84107**

Prepared by:



**SRK Consulting (U.S.), Inc.
1250 Lamoille Highway, Suite 520
Elko, Nevada 89801**

**October 2008
SRK Project No. 138408**

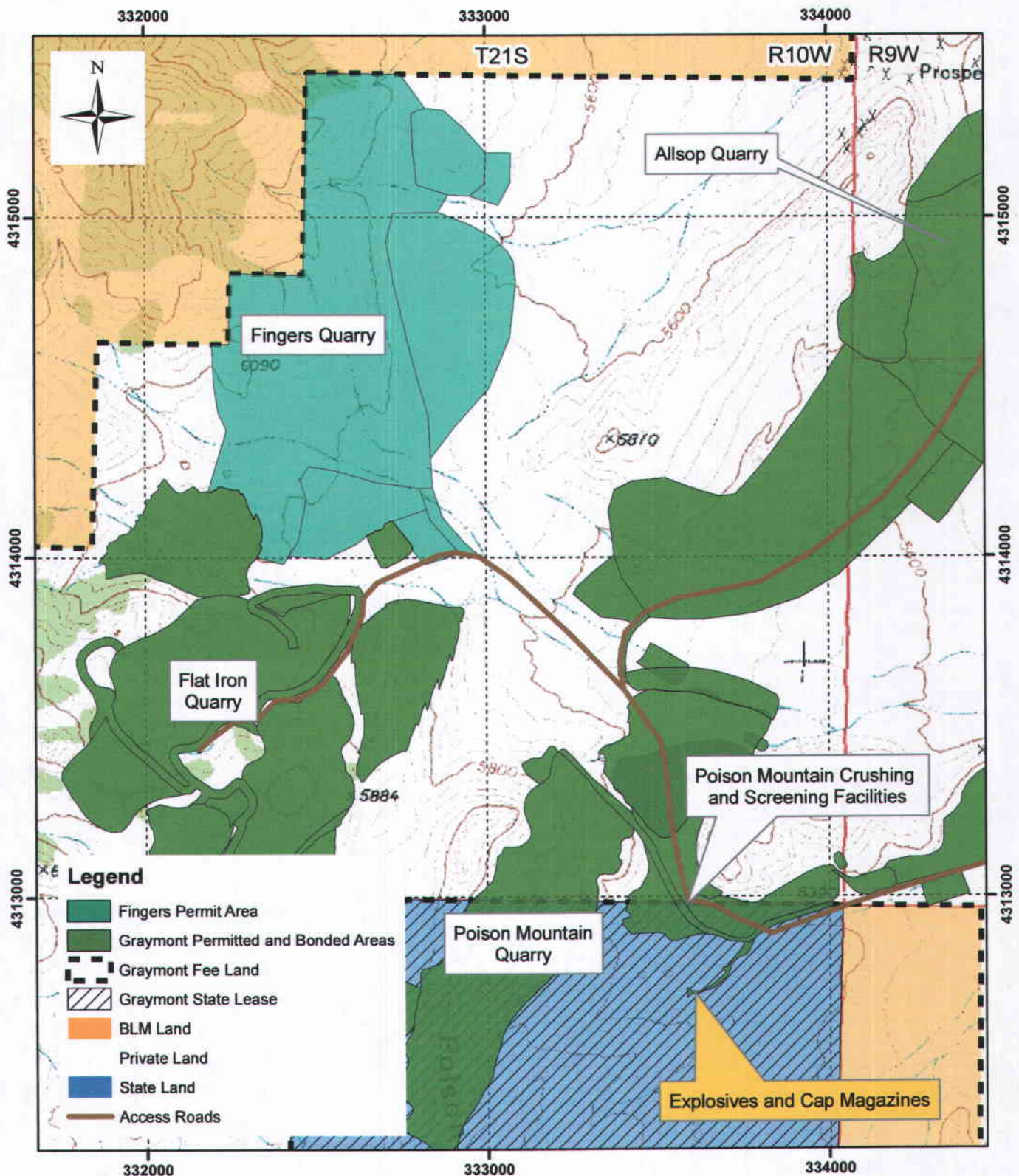


Figure B. Cricket Mountain Project - Explosives and Cap Magazines Location

Topographic Base is Candland Springs, UT 7.5' Topographic Quadrangle
 Coordinate system is UTM Zone 12N (NAD27)

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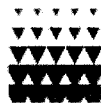
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- Appendix B: Baseline Studies for the Fingers Quarry
- Appendix C: Surety Calculation

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1. INTRODUCTION AND GENERAL INFORMATION

The Cricket Mountain Mine is an existing limestone mining and processing operation located in west-central Utah. The Mine is owned and operated by Graymont Western U.S., Inc. (Graymont) and consists of limestone quarries, overburden disposal sites, screened undersize material stockpiles, haul roads, and ancillary facilities located on unpatented mining claims on public lands administered by the United States Department of the Interior, Bureau of Land Management (BLM), on lands leased from the State of Utah, and on private lands owned by Graymont Western U.S., Inc. (Graymont). The general location is shown on Figure 1. The Mine received approval of the Plan of Operations from the Warm Springs Field Office in Fillmore, Utah. A Notice of Intention (NOI) for the existing Project was approved by State of Utah, Division of Oil, Gas and Mining (UDOGM) on January 1, 1981 (M/027/006). Additional NOIs have been subsequently filed.

Mining on Utah state lands is permitted under the Utah Mined Land Reclamation Act of 1975, Title 40, Chapter 8 of the Utah Code Annotated as amended (Utah Reclamation Act). The Minerals Reclamation Rules (R647-1 through R647-5) are enforced by UDOGM.

The Fingers Quarry will provide limestone for commercial use. The following activities will be conducted at the Fingers Project:

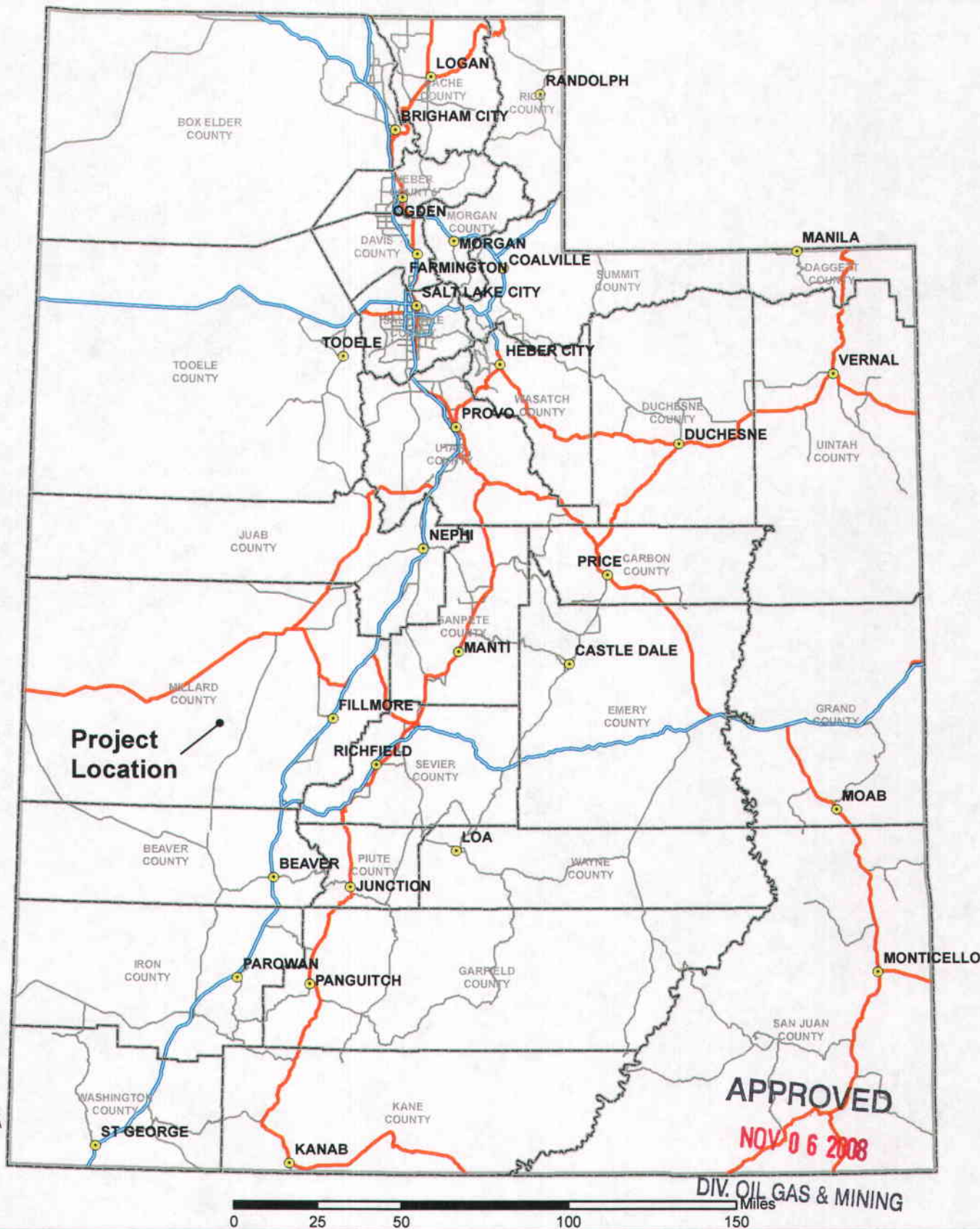
- Develop the Fingers Quarry;
- Develop overburden piles;
- Develop topsoil stockpiles; and
- Construct a haul road.

This NOI is prepared in accordance with UDOGM R647-1 through R647-5 rules for submittal. The NOI includes a general description of the mine, operating procedures, reclamation, measures to be taken to prevent unnecessary or undue degradation, and measures to be taken during extended periods of non-operation.

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EXPLANATION

- City
- Limited Access
- Highway
- Major Road

DESIGNED	VS	04/11/07
DRAWN	JQG	04/11/07
CHECKED		
APPROVED		
REVISED		
REVISED		

FIGURE 1
GRAYMONT WESTERN U.S., INC
CRICKET MOUNTAIN PROJECT
MILLARD COUNTY, UTAH
LOCATION MAP


SRK Consulting
Engineers and Scientists

SCALE:	AS SHOWN	REVISION
JOB NO:	138406-200	
MAP NAME:	RptB_Fig1_UT_Location_Map_JQG.mxd	

1.1 Applicant Information

Graymont Western U.S., Inc.
3950 South 700 East
Suite 301
Salt Lake City, Utah 84107
Contact: Robert Robison
Phone: (801) 264-6878
Fax: (801) 262-9396

1.2 File Number

The previously assigned UDOGM file number for the Cricket Mountain Mine is M/027/006. The latest approved amendment to M/027/006 is the Allsop Quarry dated December 2007.

1.3 Location of Activities

The Project is located approximately 32 driving miles southwest of the city of Delta, in Millard County, Utah. The Fingers Project can be reached by traveling approximately seven miles west of the turnoff from Highway 257 near Bloom railroad siding in the southeast corner of Section 36, Township 21 South (T21S), Range 9 West (R9W) as shown in Figure 2. The Fingers Quarry and associated components will be located in sections 23, 24, 25, and 26, T21S, R10W, SLBM, within the area of the U.S. Department of the Interior Geologic Survey (USGS) 7.5 minute series topographic map of the Candland Spring Quadrangle. Access to the existing quarry is by an improved unpaved road. Figure 3 shows the project layout.

1.4 Ownership of Land Surface and Minerals

The quarry and roads will be located on private land owned by Graymont; no mining will occur on state or federal lands.

1.5 BLM Project File Number

Not applicable. The Fingers Project does not occur on land administered by the BLM.

1.6 Project Disturbance

In the late 1970s and early 1980s, Continental Lime (now Graymont Western US Inc.) conducted exploration activities in the Project Area. Historical exploration areas have since naturally revegetated. In addition, two-track roads used for recreation access are present in the Project Area.

1.7 Project Schedule

Development of the Fingers Project will begin as soon as permits are approved. The anticipated mine life is about four years, which is subject to change with production requirements.

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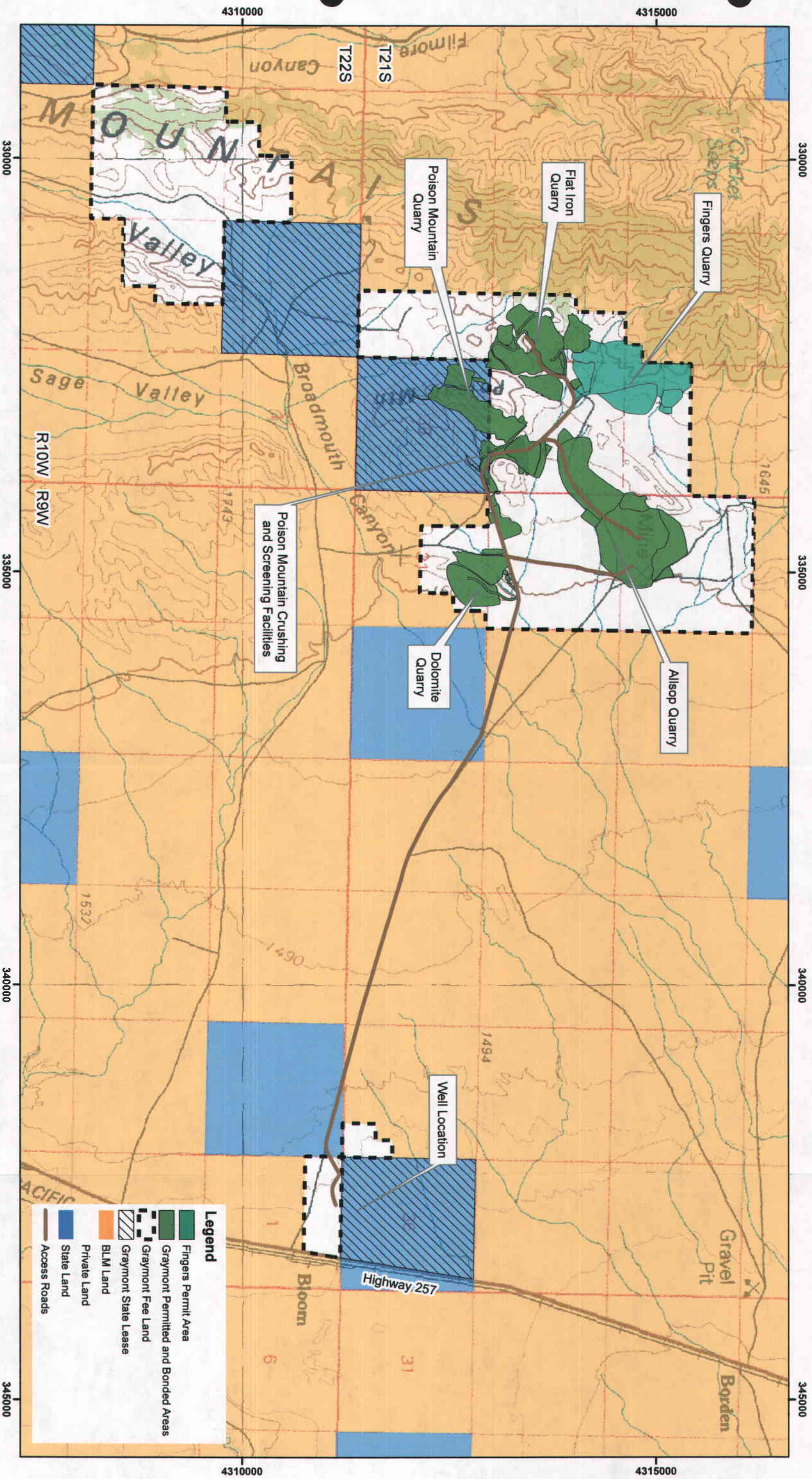


Figure 2. Graymont Western US Inc. Cricket Mountain Project
 Topographic Base is 1:100,000 USGS Series
 Coordinate system is UTM Zone 12N (NAD27)

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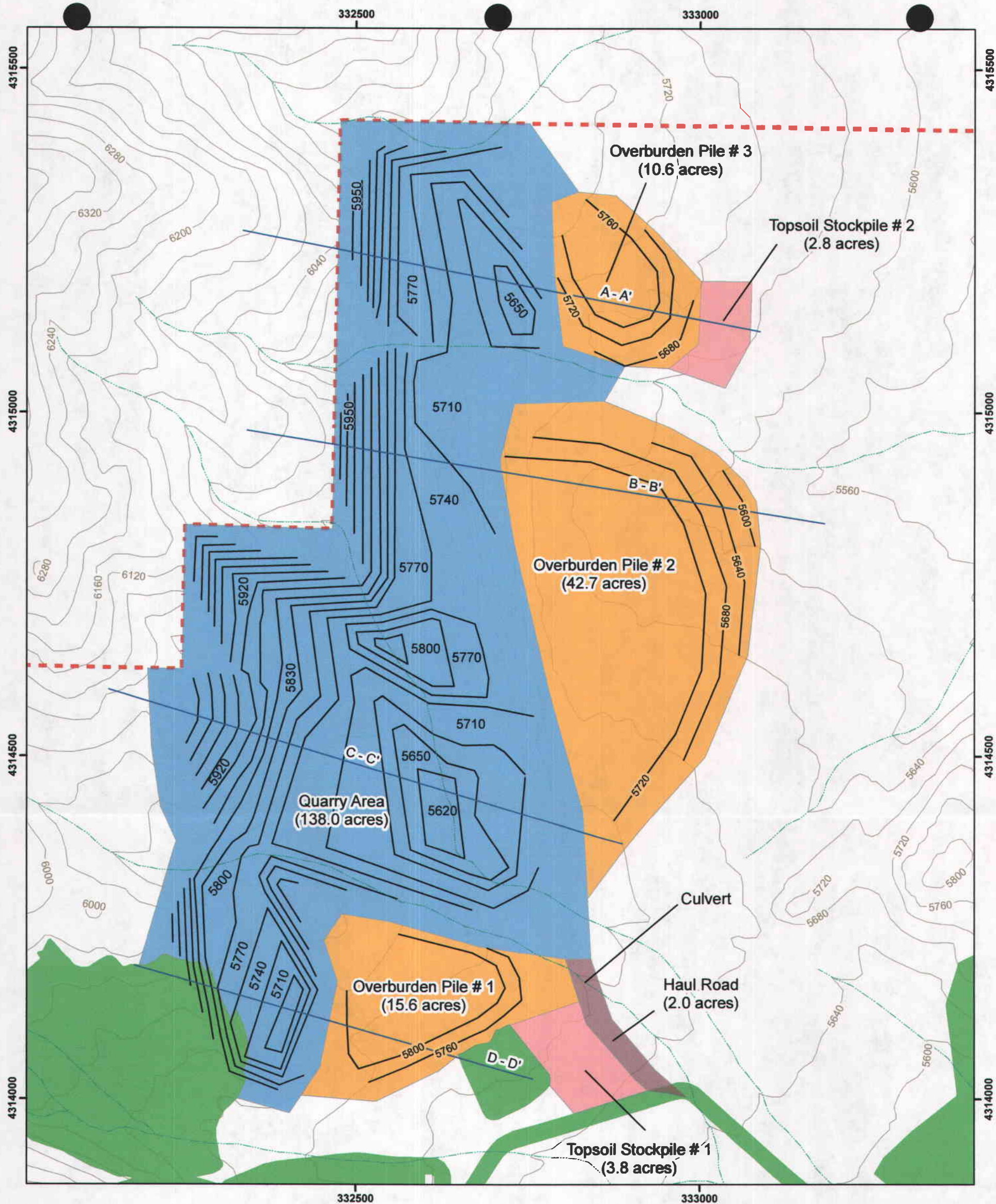


Figure 3. Fingers Area Layout

Topographic Base is Candland Spring, UT (40 foot contours)

7.5' USGS Quadrangle

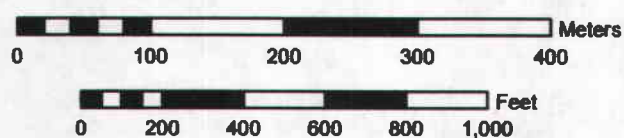
Quarry Bench Contours are 30 feet

Overburden Pile Contours are 40 feet

Coordinate system is UTM Zone 12N (NAD27)

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- Conceptual Quarry Topography
- Conceptual Overburden Pile Topography
- Graymont Fee Land
- Cross Section Locations
- Existing Ephemeral Drainages
- Graymont Bonded Areas
- Fingers Quarry Components**
- Fingers Quarry Area
- Overburden Pile
- Soil Stockpile
- Haul Road

2. Operation Plan

2.1 Overview

The Cricket Mountain Mine presently consists of several limestone mining areas (quarries), including the Poison Mountain, Dolomite, Flat Iron, and Allsop areas as well as ancillary facilities. The quarry operations consist of the excavation of high calcium limestone from outcropping deposits, crushing and sizing the stone near the quarry, and loading the crushed and sized limestone for transporting. Components associated with the mine include haul roads, quarries, overburden piles, undersize material stockpiles, soil stockpiles, and a crusher. Limestone from the Mine is shipped to a processing facility for conversion into quicklime, which is the ultimate commercial product from the operation and is used for industrial and chemical purposes, such as pH control and fluxing. The existing operations are shown on Figure 2.

The Fingers Project is located north of the existing Flat Iron Quarry and west of the existing Allsop Quarry. Limestone from the Fingers Project will be added to the existing Cricket Mountain Mine reserves. Graymont will conduct the following activities at the Fingers Project:

- Develop the Fingers Quarry;
- Develop overburden piles;
- Develop topsoil stockpiles; and
- Construct a haul road.

Table 2-1 presents the planned surface disturbances for the Fingers Project. Surface disturbance calculations include a buffer zone around each component to account for access and unforeseen disturbance requirements.

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Table 2-1: Planned Surface Disturbance

Component	Total Disturbance (acres)
Quarry Area ¹	138.0
Overburden Piles	68.9
Topsoil Stockpiles	6.6
Haul Roads	2.0
Total	215.5

¹ Acres include interior roads.

2.2 Site Geology and Ore Characteristics

The Cricket Mountains consist primarily of sedimentary strata cut by north-trending normal faults. The strata are tilted to the east, exposing younger rocks on the east side of the range. The strata in the Fingers Project Area generally dip gently (less than 25 degrees) to the east. Figure 4 shows the geology in the Project Area.

The limestone ore in the Project Area is located in Middle Cambrian rocks (Steven et al, 1990). The stratigraphic units of interest are listed below in descending chronological order:

- Limestone of Cricket Mountains – Mostly dark-gray clayey and silty limestone commonly mottled with irregular patches of brownish-gray limey dolomite. In the Poison Mountain area, the lower 700 feet of the formation consists of medium to dark-gray lime mudstone that forms ledge and slope topography. This is overlain by 300 feet of light brownish gray cliff-forming dolomite. The dolomite is overlain by dark gray limestones. The formation is reported to be approximately 2,000 feet thick.
- Dome Limestone – Cliff-forming light gray massive limestone. The basal third is medium to dark gray and forms dark ledges above the underlying upper Chisholm Formation slope. The middle third is commonly considered to be mostly calcisiltite with ten percent oolitic beds and numerous horizons of secondary dolomite. However, in the area of the Graymont quarries, this zone is characterized by high-calcium micrite and constitutes ore. The upper third of the Dome Limestone contains much dolomitic algal boundstone that forms a ledge and slope topography. The Dome Limestone ranges in thickness from 230 to more than 300 feet.
- Chisholm Formation – The upper portion of the Chisholm Formation is an olive-gray to reddish-brown shale approximately 15 to 50 feet thick.
- Howell Limestone (Upper Member) – The upper member of the Howell Limestone is a light-colored, cliff-forming lime mudstone. The thickness ranges from 100 to 160 feet thick in the Cricket Mountains area.
- Pioche Formation (Lower Member) – The lower member of the Pioche Formation consists primarily of dark-colored quartzite in the Cricket Mountains. The typical thickness is 600 to 700 feet.

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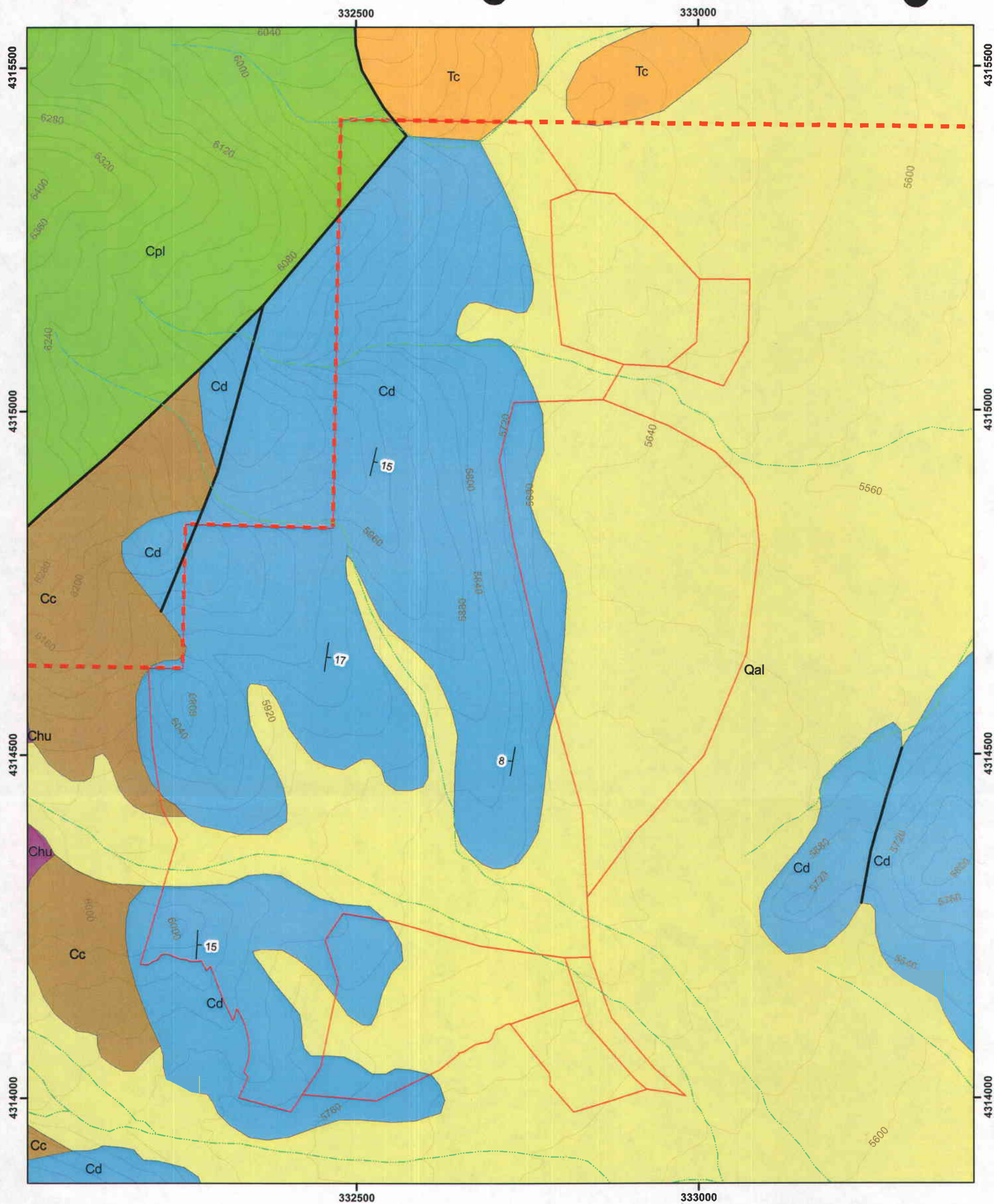
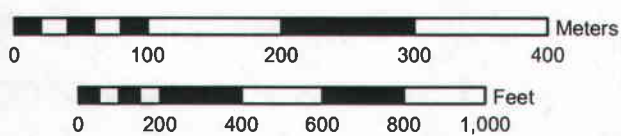


Figure 4. Simplified Geology Map

Geology is from Lehi Hintze (USGS Open File Report 84-683)
 Topographic Base is Candland Spring, UT (40 foot contours)
 7.5' USGS Quadrangle
 Coordinate system is UTM Zone 12N (NAD27)

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- Fingers Permit Area
- Graymont Fee Land
- Strike and Dip of Bedding

- Normal Faults
- Ephemeral Drainages

Geologic Units

- Qal - Quaternary Alluvium
- Tc - Tertiary Conglomerate
- Cd - Cambrian Dome
- Cc - Cambrian Chisholm Formation
- Chu - Cambrian Howell Limestone (Upper Member)
- Cpl - Cambrian Pioche Formation (Lower Member)

2.3 Site Preparation

Where available and safe, soils will be stripped from quarry and overburden piles and salvaged for use as growth media during reclamation. Where feasible, vegetation growing on areas containing salvageable soils will be removed and stored in the topsoil stockpiles to contribute organic matter to the soils. The location of topsoil stockpiles is shown in Figure 3.

2.4 Mining Operation

Prior to surface disturbing activities, growth media will be salvaged and placed in a stockpile. Limestone ore will be extracted from the quarries, and overburden will be placed in overburden piles. No deleterious materials will be excavated from the quarries or placed in the overburden piles. Quantities of material extracted from the quarries and placed in stockpiles are summarized in Table 2-2.

Table 2-2: Estimated Component Capacity Summary

Component	Ore (M tons)	Waste (M tons)	Volume (M cy)	Crest Elevation (ft amsl)	Height (ft)	Slope Angle (degrees)	Area (acres)
Quarry Area	19.4	8.4	n/a	6,100	480	15 to 45	138.0
Overburden Pile ¹ #1	n/a	0.8	0.5	5,800	80	~35	15.6
Overburden Pile ¹ #2	n/a	5.4	3.4	5,720	160	~35	42.7
Overburden Pile ¹ #3	n/a	0.9	0.5	5,760	120	~35	10.6
Topsoil Stockpile #1	n/a	n/a	0.11	n/a	18	35 to 38	3.8
Topsoil Stockpile #2	n/a	n/a	0.08	n/a	18	35 to 38	2.8
Total	19.4	15.5	4.59				213.5

¹Reclaimed slope angle will be approximately 22 degrees.

As shown in Table 2-2, the planned disturbance area is 213.5 acres, which includes buffer zones. Graymont has voluntarily adopted a 100-foot wide buffer zone where planned disturbance borders BLM land. Disturbance may not necessarily occur within the buffer zone; however, the buffer zone is included in the disturbed area for flexibility in quarry design and excavation and for surety calculation purposes. Planned areas include a buffer zone around each component to account for access and unforeseen disturbance requirements.

2.4.1 Quarry

Based on the current knowledge of the limestone deposit, conventional bench type mining methods similar to those currently used at the Flat Iron and Allsop Quarries will be used to extract ore and overburden. Drilling and blasting will be used to break the rock, and the ore will be loaded into haul trucks with a front-end loader and transported to the crusher. Overburden will be sent to one of three overburden piles shown in Figure 3. The quarry will operate 24-hours per day, seven-days per week.

Blasting will occur as needed to sustain production. Blasting will be limited to daylight hours. Any loose material generated from blasting that might migrate toward the edge of the quarry benches will be removed immediately. Explosives will be stored at existing facilities.

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Quarry design will be based on Graymont's experience at the existing Poison Mountain, Flat Iron, and Allsop quarries as well as on surface mining industry standards. Benches will be developed to ensure maximum recovery of ore. Bench faces in the quarry will range from 20 to 40 feet high but will typically be 30 feet high. Minimum bench width will be about 25 feet but will typically be much wider. Minimum bench width is dictated by equipment operating requirements. Benches will be maintained at safe operating width to allow access, where needed. Bench faces will typically be vertical. Quarry slopes will be constructed roughly parallel to the strike of the deposit and will be up to 480 feet high. Figure 5 presents typical quarry and overburden disposal site cross-sections.

The maximum expected overburden depth is 90 feet. The stripping ratio for the Fingers Quarry Permit Area is currently designed at 0.5 tons waste to one ton of ore (0.5W:1O).

Safety berms will be constructed with broken rock from the quarries to restrict access to quarry slopes that may occur during mining. Safety berms will be constructed in accordance with MSHA regulations.

The Fingers Quarry is shown on Figure 3. As presently planned, the quarry area is about 138 acres, which includes a buffer zone on the boundary of Graymont's private land that borders BLM administered land. Graymont has voluntarily adopted this 100-foot wide buffer zone where planned disturbance borders BLM land although disturbance may not necessarily occur within the buffer zone. The buffer zone is included in the disturbed area for flexibility in quarry design and excavation and for surety calculation purposes. The elevation of the existing surface ranges from about 5,600 feet above mean sea level (amsl) to about 6,100 feet amsl. Approximately 19.4 million tons of limestone ore and 8.4 million tons of overburden will be excavated from the Fingers Quarry.

The Fingers Quarry will intercept three ephemeral drainages. Water that flows into the quarry will either soak into the ground or form puddles on the quarry floor. The puddles will either evaporate or soak into the ground. The quarry floors are designed to be relatively flat but may be gently sloped to prevent storm water from leaving the quarry areas, where needed. In addition, storm water berms will be constructed along the outer edge of the quarry floors, which will prevent storm water from leaving the quarry.

A portion of the Fingers Quarry may be backfilled. An estimated 1.3 million tons of overburden could be placed in the quarry.

2.4.2 Slope Stability

Mining at the Fingers Quarry is anticipated to be within the central portion of the massive Dome Limestone and is not expected to expose any formations previously identified as unstable. If quarrying intercepts unstable formations, slope stability will be evaluated, and the quarry design will be altered, as necessary. The quarried formation has shown to be competent, which is indicated by previous mining experience, natural cliffs in excess of one hundred feet high, and absence of talus slopes at the base of the cliffs within the Project Area. Currently, no unstable interbeds or problematic joint sets have been identified within the Dome Limestone, which is in the same zone targeted for mining in the Fingers Quarry. However, if any problematic joint sets are recognized during quarrying, the joint sets will be evaluated for effect on slope stability.

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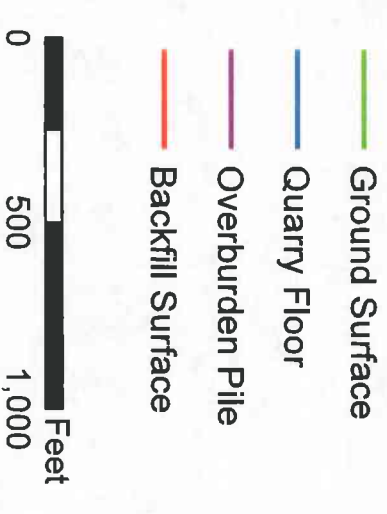
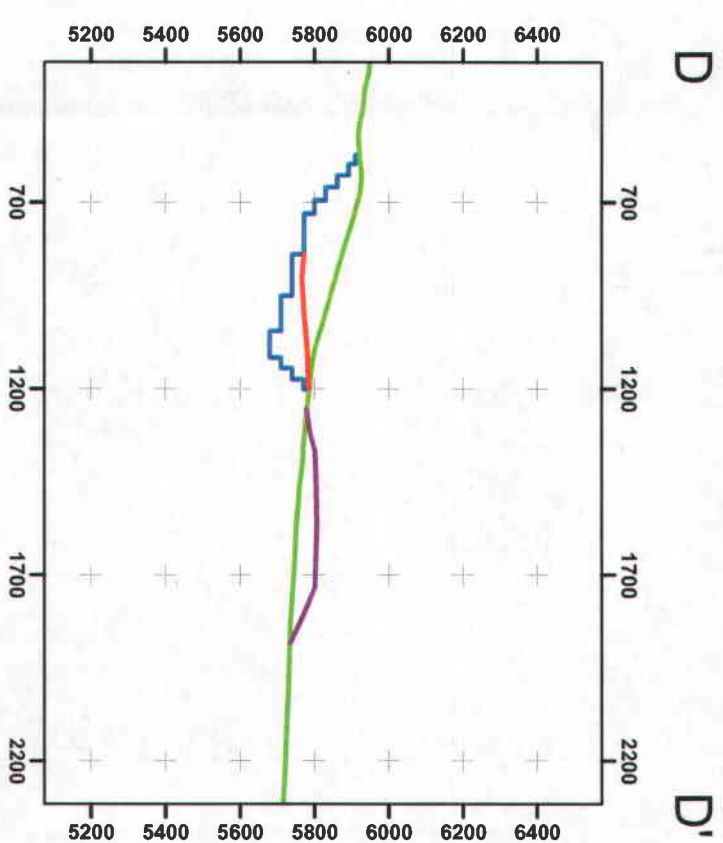
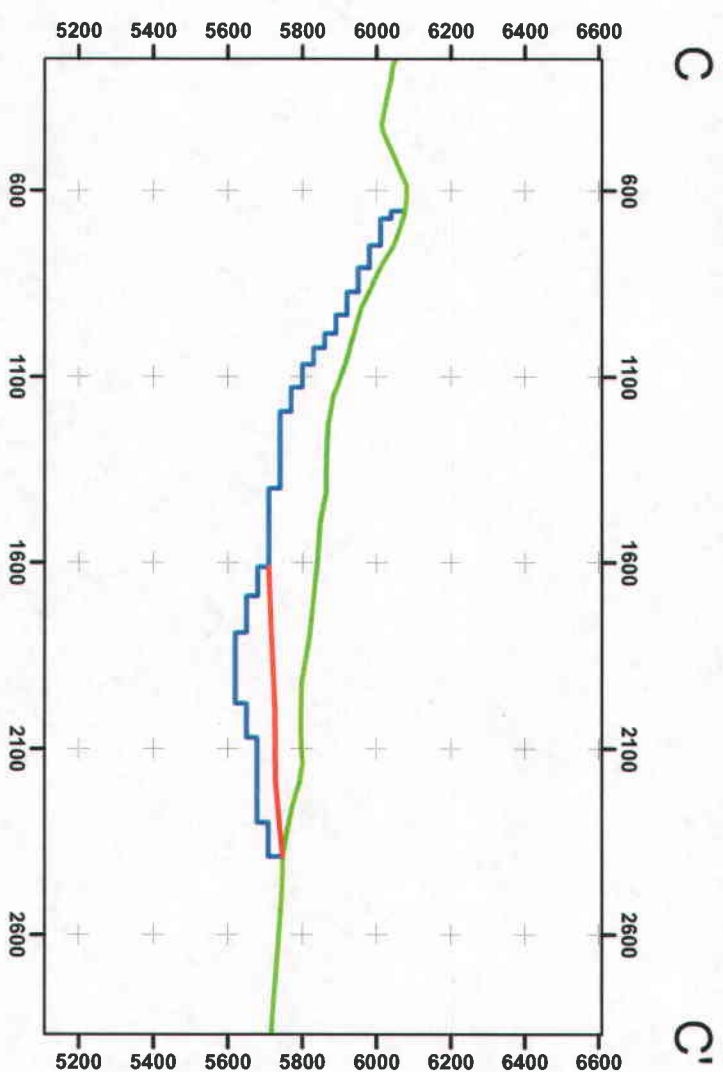
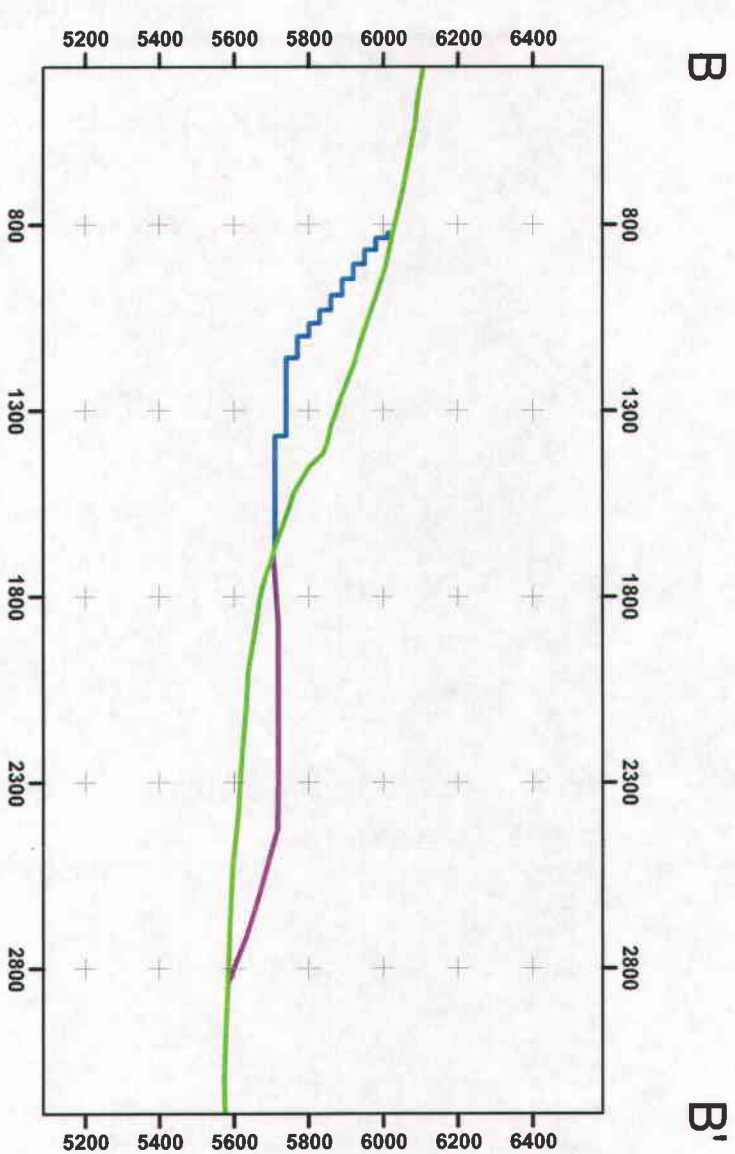
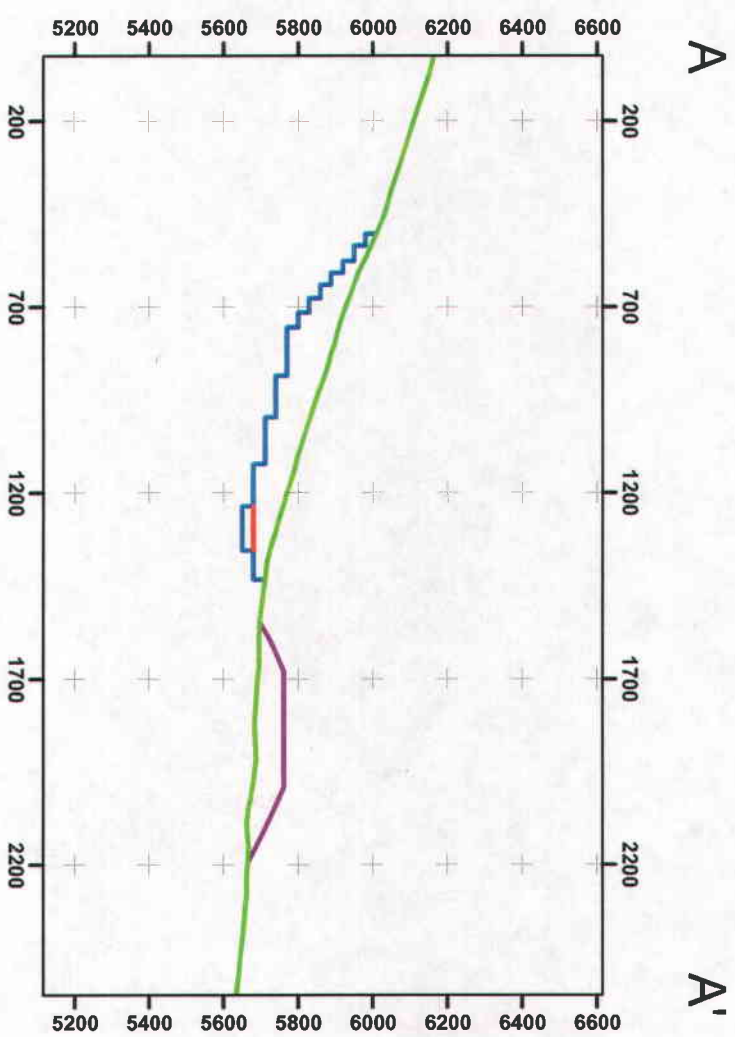


Figure 5 - Quarry and Overburden Pile Cross-Sections

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Mapped normal faults in the Fingers Quarry commonly dip steeply and trend to the northeast, which orients the faults at a high-angle to the quarry slope. Therefore, the faults do not present substantive risk to slope stability. Unmapped faults identified during quarrying will be evaluated and mitigated, as necessary.

No highwalls, slopes exceeding 45 degrees and not including quarry benches, are anticipated at the Fingers Quarry during operation or after reclamation. Slopes for the Fingers Quarry were designed on the basis of bedding orientation and economic cutoff for overburden. The quarry slope along the footwall will be approximately parallel to the bedding orientation, which generally ranges from 15 to 20 degrees. Where the hanging wall thickness exceeds the economic cutoff, the slope will be mined at up to 45 degrees. Bedding planes intersecting the hanging wall slope are expected to be stable due to the shallow dip. The overall maximum quarry height is anticipated to be about 480 feet. As shown in Figure 5, quarry slopes will range from 15 degrees to 45 degrees and will depend upon geology and project economics. As the geology is generally consistent throughout the mining area, no problematic complex slope geometry is expected.

Water was not encountered while drilling in the Fingers Quarry Area, indicating that groundwater is below 5,640 feet amsl. This is below nearly all of the planned Fingers excavation, and deeper drilling in other areas of the Cricket Project suggests groundwater is well below all planned excavations. Groundwater depth limits any potential for adverse effects on slope stability.

Previous experience at the Cricket Mountain Quarries indicates that the mined limestone is very stable, and no large-mass stability safety issues within the quarry have been noted since the beginning of operations in 1981. The other quarries at Cricket Mountain have similar slope angles and heights as the Fingers Quarry. The configuration of the other quarries is analogous in regards to spatial relation of geology (i.e. bedding orientation, faults, and stratigraphic units) and therefore provides a good comparison with the planned Fingers Quarry.

Rockfalls and back-break will be reduced and managed by continuing to refine blasting designs and methods. Bench heights have been defined in order to allow equipment to work safely. However, if rockfall becomes a safety concern, mitigation measures will be taken, which may include bench scaling or avoidance.

The quarries will be regularly monitored for any signs of instability, such as significant raveling or fault exposure, and the quarries will be managed in accordance with MSHA safety guidelines and the Fingers Quarry operations and reclamation plan. Quarry slopes and benches will be regularly monitored by quarry crews, supervisors, and when required, mining engineers.

2.4.3 Overburden Piles

Up to seven million tons of overburden will be stored in one of three overburden piles. Overburden will be placed in the overburden pile having the shortest haul distance from the active mining area. There will not be any material segregation in any of the three overburden piles.

To account for potential changes in the mine plan, the overburden piles have been designed with extra capacity; the ultimate size of the overburden piles will be dictated by project economics. Prior to end-dumping overburden, growth media will be salvaged and stockpiled in one of the two topsoil stockpiles identified in Figure 3. Figure 5 presents typical quarry and overburden pile cross-sections.

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Material placed in the overburden piles will be a lower grade of limestone than the material shipped for processing. No sulfide minerals have been identified in any of the materials to be excavated, and no deleterious materials will be placed in the overburden piles.

The overburden piles will be constructed by end-dumping in lifts in valleys or on hillsides. Overburden piles will either be built in single lifts or with lifts approximately 40 feet high offset by benches approximately 25 feet wide. Constructed slopes of the overburden piles will be 35 degrees or less. The overburden piles will be accessed via benches or roads within the permit boundary.

Overburden piles will be visually monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective. During reclamation, sloped surfaces will be contour furrowed, if necessary.

2.4.4 Limestone Crushing and Screening

A crusher will be used to crush and screen limestone hauled from the Fingers Quarry to a nominal size of minus 2½ inches by plus 3/16 inch. The crushing and screening facilities are part of the existing Cricket Mountain Quarry NOI amendment approved October 27, 1993. New crushing and screening facilities are not required to support the Fingers Quarry operations. Crushed ore will be stockpiled near the crusher and/or hauled from the quarry.

2.4.5 Screened Undersize Material Stockpiles

Screened undersize material will be stockpiled on the existing Poison Mountain undersize stockpile or in the newly permitted stockpile area (which is an extension of the Poison Mountain undersize stockpile). The newly permitted stockpile area is located in the Allsop Quarry Area and was permitted in December 2007.

2.4.6 Roads

Haul roads are located in the quarry area, and locations of these roads are expected to change as required for mining operations. Roads within the quarry area will be up to 100 feet wide and constructed at a maximum gradient of eight percent. Maintenance of haul roads will include grading and application of water for dust control as needed.

As shown in figures 2 and 3, a haul road will be constructed from the Flat Iron Quarry Access Road to the Fingers Quarry. The running width will be approximately 80 feet, and the disturbance width will be approximately 100 feet but may vary with topography to accommodate cut and fill construction.

The haul road will be constructed to safely accommodate haul trucks and to meet Mine Safety and Health Administration (MSHA) requirements. Disturbance widths will include safety berms on the outside edges and internal drainage ditches, where necessary, and culverts or swales will be installed across drainage crossings.

The existing Poison Mountain Quarry-Cricket Mountain Plant access/haul road will be used to haul crushed and screened Fingers Quarry ore from the crusher. Use of the road was approved in 1979 as an 80-foot ROW (U.S. BLM, 1996). The crushed ore will be hauled by off-highway trucks of up to about 110-ton capacity from the crusher area.

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2.4.7 Soil Stockpiles

Salvageable soil, including surface vegetation, will be removed and stockpiled within the areas planned for disturbance. Suitable material will be removed, where practical, so as to be available for reclamation. Salvageable soil is defined as any surface material that is presently supporting plant growth. Past experience at Cricket Mountain indicates that the practical minimum thickness for salvageable soil is six inches. Graymont will use equipment from the on-site fleet to salvage topsoil; this equipment will include but not be limited to dozers, loaders, and haul trucks.

Graymont estimates that approximately 168,500 cubic yards of soil will be salvaged from the disturbance areas. However, the total volume may change depending upon the actual conditions encountered during operations.

Following stripping, soil will be stored in the stockpiles, which have been located away from existing drainages shown on Figure 3. Approximate soil stockpile dimensions and capacities are shown in Table 2-3. The stockpiles will be contoured to minimize wind erosion and revegetated with the reclamation seed mix used on the existing Poison Mountain soil stockpiles. Signs will be posted to prevent disturbance to the soil stockpiles. Some of the disturbance areas are heavily infested with cheatgrass. Graymont will place the top few inches of stockpiled soil on the bottom of the pile and evaluate treating the stockpiled soil with an herbicide to reduce the spread of cheatgrass. Soil stockpiles will be seeded the first fall after the soil is salvaged.

Table 2-3: Topsoil Stockpile Dimensions and Capacities¹

Component ¹	Length (ft)	Width (ft)	Height (ft)	Volume (cy)
Topsoil Stockpile #1	540	285	18	102,600
Topsoil Stockpile #2	485	235	18	76,000
Total				178,600

¹ Stockpile dimensions include a buffer around the stockpiles to account for access and unforeseen disturbance requirements.

2.4.8 Buildings and Yards

There are no buildings and yards at the Fingers Quarry. Existing buildings and yards at the Poison Mountain Quarry will service the Fingers Quarry activities.

2.4.9 Water Supply

An existing permitted well, shown in Figure 2, currently supplies water for the mining operations and processing facilities. Water use associated with the mining operations is generally limited to dust control on haul/access roads and disturbed areas, and during drilling and crushing operations. The water for mining operations is transported by water trucks, which are filled at the well. Existing well production is expected to be sufficient to meet the water needs.

2.4.10 Equipment Requirements

Graymont will employ equipment from the existing operations to mine and haul ore from the Fingers Project. Plans include using trucks currently working in the existing operations to haul ore from the quarry, and loaders currently operating in existing operations will be used to load the trucks. Additional haul trucks and loaders will be

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added as needed to meet production demands. Table 2-4 presents a list of haul trucks and loaders used in the existing operations.

Table 2-4: Current Equipment List

Equipment	Model	Quantity
<u>Loader</u>		
	CAT 992	2
	CAT 990	1
	CAT 988	1
<u>Truck</u>		
	CAT 777	3

2.4.11 Project Work Force

The total current work force is 59 people, 18 of which currently work in the existing quarries. The existing work force will be utilized to conduct operations at the Fingers Quarry.

2.4.12 Blasting

Blasting will occur as needed to sustain production, but blasting will be limited to daylight hours. Blasting protocols meet or exceed MSHA regulations. Any loose material generated from blasting that might migrate toward the edge of the quarry benches will be removed immediately. Stemming and burden width will be modified as needed to reduce fly rock.

The existing explosives magazine and cap magazine will be used for the Fingers Quarry operation.

Typically, ammonium nitrate and fuel oil (ANFO) will be used as blasting agents with other products depending on conditions. Blasting agents will be stored in compliance with applicable Bureau of Alcohol Tobacco and Firearms and MSHA regulations.

2.4.13 Fuel Storage and Use

Diesel fuel and gasoline are stored in above ground tanks near the permitted crushing and screening facilities at the Poison Mountain Quarry. The tanks are installed on concrete pads and surrounded by concrete berms to contain leaks, spills or ruptures of the tanks. Oil is stored inside a containment area within a building. These facilities will be used for the Fingers Quarry operation. Diesel fuel, gasoline, and oil will be handled in accordance with industry standards as well as state and federal regulations.

2.4.14 Sanitary and Solid Waste Disposal

Portable toilets will be used for sanitary waste at the mining area. The toilets will be serviced by a licensed contractor. Used tires, scrap lumber, etc. will be stored in an existing "bone yard". No toxic or hazardous materials will be stored on site. All waste materials will be removed at closure and disposed of in an approved landfill.

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2.4.15 Safety and Site Control

The Project will be permitted as a mining operation and will operate in conformance with applicable MSHA safety regulations (30 CFR 1-199) as well as requirements of the Utah Mined Land Reclamation Act and associated rules. The access road to the Fingers Project is restricted to employees and authorized visitors.

Warning signs will be placed where quarry slopes are located. Warning signs will be placed in a location that is visible from more than one viewpoint, and multiple signs will be placed in areas where signage will not be visible from more than one viewpoint.

2.4.16 Storm Water Management

Rain water or snowmelt in the quarry will either soak into the ground or form puddles on the quarry floor. The puddles will either evaporate or soak into the ground in a short period of time and will not affect operations. The quarry floors are designed to be relatively flat and will be gently sloped to prevent storm water from leaving the quarry areas. In addition, storm water berms will be constructed along the outer edge of the quarry floors, which will prevent storm water from leaving the quarry.

The Fingers Quarry will intercept three ephemeral drainages. During operations, water that flows into the quarry is anticipated to either soak into the ground or form puddles on the quarry floor. The puddles will either evaporate or soak into the ground.

The quarry haul roads will be protected on both sides by safety berms. Under extreme rainfall conditions, storm water will travel along the safety berms to temporary catch basins that will be located within the permit area. The water that collects in the catch basins or other areas will either soak into the ground or evaporate. No storm water will be discharged off the Project Area from the catch basins or haul roads within the quarry areas.

Overburden piles will be visually monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective. During reclamation, sloped surfaces will be contour furrowed, if necessary.

Surface waters will be managed to avoid excessive sediment loading to runoff outside the Permit Area. No jurisdictional waters will be affected by quarry and support operations. Additional storm water management details are provided in the Storm Water Pollution Prevention Plan located in Appendix B of the Allsop Quarry amendment.

Climatological data collected at the Deseret weather station and representative of the Fingers Project are presented in Table 2-5. The monthly and annual average information is based on data collected from August 1891 to June 2007 (period of record) as obtained from the Western Regional Climate Center (WRCC) database. The WRCC database includes precipitation and temperature data extracted from the Deseret station, which is located approximately 26 miles from the Fingers Project at an approximate elevation of 4,590 feet above mean sea level (amsl).

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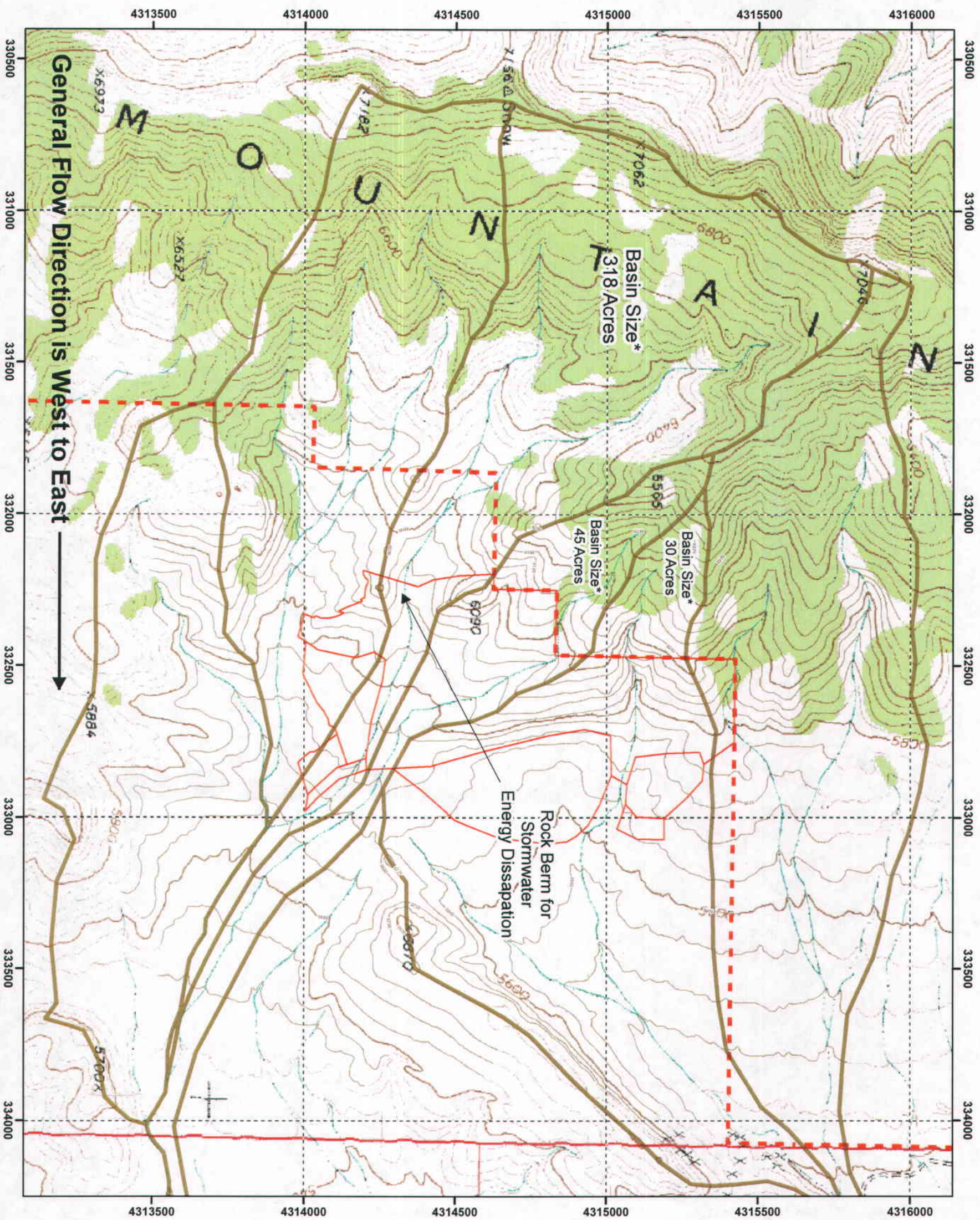


Figure A. Fingers Watershed Map
 Topographic Base is Candland Spring, UT
 7.5' USGS Quadrangle
 Contours are 40 feet
 Coordinate system - UTM Zone 12N (NAD27)

Rev. August 15, 2008
 Graymont Western US Inc.

- Fingers Permit Area
- Graymont Fee Land
- Ephemeral Drainages
- Watersheds

*Basin size is area west of Fingers Permit Area.



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Table 2-5: Summary of Climatological Data for the Fingers Project

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Precipitation (in.)	Average Total Snowfall (in.)
January	38.5	13.2	0.56	4.2
February	45.4	18.9	0.60	3.5
March	55.8	25.3	0.77	2.9
April	64.9	31.8	0.88	1.5
May	74.4	39.8	0.92	0.3
June	84.9	47.2	0.43	0.0
July	93.0	55.1	0.46	0.0
August	90.7	53.4	0.60	0.0
September	81.1	42.8	0.61	0.1
October	68.1	31.9	0.78	0.3
November	52.5	21.8	0.59	1.9
December	40.1	14.5	0.57	3.5
Annual	65.8	33.0	7.76	18.2

Source: Western Regional Climate Center, Deseret Station (422101)

Storm event data for the Fingers Quarry were evaluated based on the *Precipitation-Frequency Atlas of the United States*, Atlas 14, Volume 1, Version 4 from the National Oceanic and Atmospheric Administration (NOAA). Point precipitation frequency estimates from the Atlas were selected based on the Fingers Project location of 38.97° N, 112.93° W. The 24-hour storm events with recurrence intervals of 10, 25, and 100 years are provided in Table 2-6 below.

Table 2-6: Storm Event Data for the Fingers Project

Frequency/Duration	Precipitation (Inches)	Source
10-Year, 24-Hour	1.58	NOAA Atlas 14, vol. 1, v.4
25-Year, 24-Hour	1.87	NOAA Atlas 14, vol.1, v.4
100-Year, 24-Hour	2.31	NOAA Atlas 14, vol.1, v.4

2.4.17 Erosion and Sediment Control

Best Management Practices (BMPs) will be used to limit erosion and reduce sediment in precipitation runoff from Project components and disturbed areas during construction and operations. BMPs may include, but are not limited to: straw bale sediment traps, diversion ditches, and rock and gravel cover. Straw bales will be used in areas where temporary erosion and sediment control measures are installed while rock and gravel cover will be utilized on permanent erosion and sediment control features. Vegetation is also a BMP and may be used as a cover to reduce the potential for wind and water erosion. Following construction activities, identified areas will be seeded as soon as practical and safe.

Sediments containing deleterious materials have not been identified and are not expected to exist at the Fingers Quarry. Material that will be excavated in the quarry has a carbonate composition, and the major constituents are calcite, dolomite, and silica.

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Any sediment and erosion control measures will be visually inspected annually or as soon as practicable following large storm or runoff events. Maintenance will occur on a regular basis and repairs performed as needed.

2.4.18 Emission Control

Methods for controlling dust are specified in the air quality permit (operating permit #2700004001), which is for the Cricket Mountain Project. Water application with the use of a water truck will be the primary method of dust suppression on haul roads and disturbed areas of the site. Speed limitations will also be employed for the haul roads where required. A chemical dust suppressant, such as magnesium chloride or calcium chloride, will be applied to the access and haul roads at intervals specified in the air quality permit. Any chemicals utilized for dust control will be handled in accordance with industry standards and applicable state and federal regulations. If practical, disturbed areas will be revegetated on an interim basis to minimize exposed surfaces.

2.4.19 Concurrent Reclamation

Concurrent reclamation reduces erosion, provides early impact mitigation and reduces final reclamation work. Graymont intends to optimize the amount of concurrent reclamation at the site. This will allow larger-scale testing of grading, reclamation cover placement, and revegetation techniques. After storm events, project components will be inspected and evaluated to ensure that the components are maintained in an environmentally sound manner.

2.4.20 Cultural Resources

Archaeological Research Consultants (ARCON) conducted a cultural resources inventory in the Project Area in June 1993 and in May 1994, and Western Cultural Resource Management, Inc. (WCRM) conducted a Class III cultural resources inventory in the Project Area in 1996. The remainder of planned disturbance areas will be surveyed prior to construction. Sites that may be considered potentially eligible for the National Register of Historic Places will either be avoided or mitigated in accordance with Section 106 procedures. If exploration activities uncover human remains, Graymont will follow procedures described in the Native American Graves Protection and Repatriation Act. Appendix A presents the results of the cultural resources survey conducted by ARCON for the Project Area. The WCRM study, *A Final Report of a Class III Inventory of the Cricket Mountain Quarry Expansion, 1996 for Continental Lime, Inc., Millard County, Utah*, was published in February 1997.

2.4.21 Wildlife

In October 2007, a raptor survey was conducted by SRK. The results of the survey are located in Appendix B. Because no active raptor nests have been identified in the permit area, Graymont will not need to implement procedures to mitigate or avoid direct impact to nests prior to the beginning of construction.

Surveys for special status species of plants and animals have been conducted for the Project Area, and survey results are located in Appendix B. Graymont will not need to implement procedures to mitigate or avoid direct impact to special status species in or near the Project Area prior to initiation of construction because special status species were not identified.

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The existing wildlife guzzler located in Section 26 of Township 21 South, Range 10 West will be relocated in an area away from mining activity. The 'new' location will be selected in coordination with Utah Division of Wildlife Resources (UDWR) specialists.

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3. Impact Assessment

Rule R647-4-109 of the UDOGM Minerals Program requires the preparation of an impact assessment identifying potential surface and/or subsurface impacts. An EA was completed for the Cricket Mountain Project in April 1996 (BLM, 1996). This environmental assessment can provide additional context for the impact assessment section of this revision.

3.1 Surface and Ground Water Resources

Increased erosion and increased or altered sediment loading could occur within the permit area from mining activities. Where roads cross drainages, Graymont will install culverts and/or water crossings as needed to limit or prevent increased erosion and sediment loading. BMPs will be used to control sediment, limit erosion, and reduce sediment in precipitation runoff from Project components and disturbed areas during construction and operations as described in Section 2.4.17. Through the use of engineered mine component designs, culvert and water crossing installations, and BMPs, surface waters will be managed to avoid excessive sediment loading to runoff outside the permit area. The limestone does not contain any deleterious materials that could negatively impact surface water.

Surface water in the Project Area flows only in response to snowmelt or precipitation events. Graymont has measured precipitation at a monitoring point located west of Highway 257 near Bloom Siding in Section 36, Township 21 South (T21S), Range 9 West (R9W); precipitation measurements are summarized in Table 3-1.

Table 3-1: Precipitation at Monitoring Point Located in Section 36, T21S, R9W

Month	2000 (inches)	2001 (inches)	2002 (inches)	2003 (inches)	2004 (inches)	2005 (inches)	2006 (inches)
January	1.57	0.59	0.32	0.64	0.74	1.61	0.94
February	1.56	0.41	0.13	0.89	0.98	0.96	0.27
March	0.69	0.74	1.19	1.08	0.27	1.72	1.56
April	0.62	0.67	1.22	0.97	1.79	1.19	0.69
May	0.74	0.54	0.12	0.62	0.34	1.21	0.35
June	0.35	0.50	0.06	0.86	1.08	0.36	0.60
July	0.65	0.71	0.68	0.12	0.29	0.15	1.27

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Month	2000 (inches)	2001 (inches)	2002 (inches)	2003 (inches)	2004 (inches)	2005 (inches)	2006 (inches)
August	0.99	0.09	0.08	1.00	0.16	0.54	0.44
September	0.85	0.12	0.91	0.29	0.07	0.64	0.85
October	2.35	0.50	1.38	0.14	1.55	0.87	2.36
November	1.28	0.72	0.60	0.96	0.58	0.05	0.40
December	0.42	0.78	0.12	1.11	0.89	0.91	0.41
Annual	12.07	6.37	6.81	8.68	8.74	10.21	9.54

No jurisdictional waters will be affected by quarry and support operations. No impacts to surface water resources are projected.

Groundwater could be impacted if mining operations intercept the water table, but at the Fingers Project, groundwater occurs at a depth below the quarry bottom. No exploration drill holes at the Fingers Project or elsewhere at the Cricket Mountain Project have encountered water. Drill holes drilled as part of mining activities will be plugged in accordance with UDOGM rule R647-4-108. The limestone does not contain any deleterious constituents that will affect groundwater quality. Instead of drilling a new well within the permit area, Graymont will use an existing well to supply water for dust control within existing authorized water use rates.

3.2 Wildlife

Direct and indirect impacts could occur to wildlife resources and their associated habitats. The quarry will remove 138.0 acres of habitat for the species discussed above. Approximately 124.2 acres of this habitat loss will be temporary, as the benches and quarry floor will be revegetated and eventually provide habitat for these species. The remaining acreage (13.8 acres) will be a long-term or permanent loss of vegetative habitat; however, the vertical bench faces will provide potential nest sites for raptors, cliff swallows, and bats that roost in rock crevices. Therefore, the final quarry configuration will provide a new habitat type that is an analogue to the cliffs and rock outcrops that occur in the area. Baseline surveys have been conducted to determine the extent of the wildlife habitat within the permit area as well as to evaluate the impacts to wildlife habitat from mining operations.

Wildlife that may be found in the area include mule deer, pronghorn antelope, black-tailed jackrabbit, desert cottontail, badger, coyote, bobcat, white tail antelope squirrel, chukar partridge, Cooper's hawk, American kestrel, northern harrier, rough-legged hawk, pinyon jay, mourning dove, black-throated sparrow, bats, and horned larks (BLM, 1996). Bats may inhabit caves in the upland cliffs.

Yearlong antelope habitat covers the Project Area (UDWR, 2004). The Utah Division of Wildlife Resources (UDWR) describes the antelope habitat as substantial but not critical because this habitat type covers an extensive area throughout the area (BLM, 1996).

Significant raptor populations occupy areas near the Project Area on a year-round basis (BLM, 1996). Golden eagles, prairie falcons, and Northern harriers nest and winter in the crucial raptor habitat around the Cricket Mountains. Nesting pairs will use the same nest for different years (BLM, 1996); however, no known raptor nest sites exist within the area of disturbance (SRK, 2007).

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The three species of upland game include chukar partridge, sage grouse, and ring-necked pheasant. Chukar partridge range is located in the Cricket Mountains and falls within one half mile of the Project Area. No active sage-grouse strutting grounds or leks are located in the Project Area. Ring-necked pheasants were not observed during the 2007 biological resources survey (SRK, 2007).

Surveys of the Project Area have not identified the Fingers Quarry Area as critical habitat to any wildlife species within the permit area. Habitat that is removed during mining will be re-established during reclamation. If previously unidentified raptor nests are located, the nests will be avoided during the nesting season.

The existing wildlife guzzler will be relocated to an area away from mining activity to continue to provide a water source. The 'new' location will be selected in coordination with UDWR specialists. There will be a temporary impact to wildlife in the area during the wildlife guzzler relocation period.

3.3 Special Status Species

Surface disturbing activities from mining activities have the potential to remove habitat for special status species or federally-listed threatened or endangered species. Baseline studies have been conducted to determine the presence of special status or federally-listed threatened or endangered plant species.

Graymont conducted a survey in 1996 in the near vicinity of the Project Area to identify the potential for special status species to occur. No federally-listed threatened or endangered plant species were identified at that time (BLM, 1996). Sensitive plants of concern that have the potential to occur in the Project Area include: inch-high milkvetch (*Astragalus uncialis*), compact cateye (*Cryptantha compacta*), ibex buckwheat (*Eriogonum nummularae* var. *ammophilum*), Tunnel Springs beardstongue (*Penstemon concinnus*), and Jones globemallow (*Sphaeralcea caespitosa*) (BLM, 1996). Inch-high milkvetch is known to occur at Long's Ridge about 25 miles north of the Project Area (BLM, 1996). Compact cateye is known to occur in western Millard County near the Desert Experiment Range, and ibex buckwheat is known to occur at Sand Pass about 40 miles north of the Project Area (BLM, 1996). Tunnel Springs beardstongue and Jones globemallow are known to occur in western Millard and Beaver Counties (BLM, 1996).

None of the sensitive plant species were located during the 1996 survey after walking linear transects in areas of high and moderate potential habitat (BLM, 1996). There was low potential habitat for inch-high milkvetch in the surrounding area and potential habitat on limestone and dolomite outcrops for Jones globemallow (BLM, 1996).

A second survey conducted in August 1998 adjacent to the Project Area did not identify any threatened, endangered, endemic, or sensitive plants or mammal species (Mt. Nebo Scientific 1998).

The UDWR designated a 41,600-acre area in the Warm Springs Field Office as crucial raptor nesting habitat (March 1-June 30). The Project Area falls within this designated area. UDWR requires a 1/2 mile protected zone surrounding the nest of any raptor during the breeding season.

A survey to identify the presence or absence of ferruginous hawk and Western burrowing owl was conducted in the Project Area by SRK in October 2007. Neither species was present; the survey methods and results are presented in Appendix B.

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In the event subsequent surveys identify special status or federally listed threatened or endangered species, Graymont will work with local agencies to determine appropriate mitigation measures. Current baseline studies indicate that no direct, indirect, or residual impacts to special status species are projected to occur within the permit area since special status species and threatened or endangered species with the potential to occur within the permit area have not been identified as currently existing within the Project Area.

3.4 Soil Resources

Surface disturbing activities have the potential to modify soil resources important for supporting vegetation. Types of impacts would include vegetation clearing, excavation, grading, and salvage of growth media. Soil disturbances will impede maturation of soil development, degrade soil structure, and hinder biological activity. Additionally, exposed soils will be susceptible to wind and water erosion; however, this impact would be reduced by interim revegetation and BMPs.

About 168,500 cubic yards of soil will be reclaimed from undisturbed sites and stockpiled for future reclamation. Figure 6 shows the location of the soil associations that will be affected.

Topsoil stockpiles will be seeded to prevent impacts from wind and water erosion. Some of the disturbance areas are heavily infested with cheatgrass. Graymont will place the top few inches of stockpiled soil on the bottom of the pile, and evaluate treating the stockpiled soil with an herbicide to reduce the spread of cheatgrass. Soil stockpiles will be seeded the first fall after the soil is salvaged. Impacts to soil resources are anticipated to be minimal through planning prior to conducting surface disturbing activities,

3.5 Slope Stability

There is potential for slope failures to occur within the quarry areas or on the overburden piles. Through engineering design considerations and operational practices, impacts to slope stability have been limited or precluded.

Impacts to quarry slope stability have been considered as outlined in Section 2.4.2, and appropriate mitigation measures are in place to limit impacts as described in Section 2.4.2 and below.

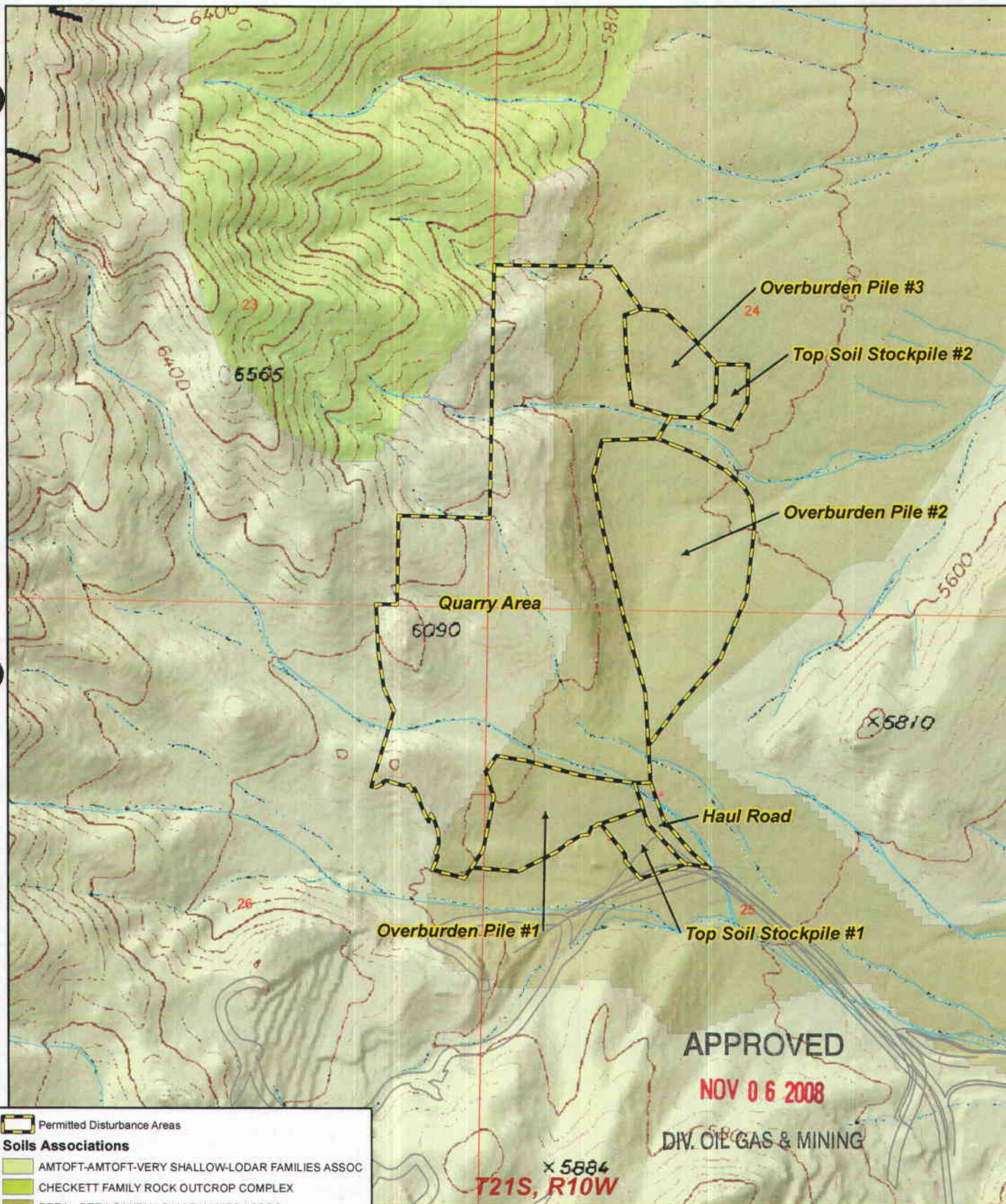
Rockfalls and back-break will be reduced and managed by continuing to refine blasting designs and methods. Bench heights have been defined in order to allow equipment to work safely. However, if rockfall becomes a safety concern, mitigation measures will be taken, which may include bench scaling or avoidance.

The quarries will be regularly monitored for any signs of instability, such as significant raveling or fault exposure, and the quarries will be managed in accordance with MSHA safety guidelines and the Fingers Project operations and reclamation plan. Quarry slopes and benches will be regularly monitored by quarry crews, supervisors, and when required, mining engineers.

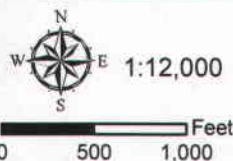
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- Permitted Disturbance Areas
- Soils Associations**
- AMTOFT-AMTOFT-VERY SHALLOW-LODAR FAMILIES ASSOC
 - CHECKETT FAMILY ROCK OUTCROP COMPLEX
 - DERA - DERA SANDY LOAM FAMILIES ASSOC



DESIGNED	RK	01/31/08
DRAWN	RSS	01/31/08
CHECKED		
APPROVED		
REVISED		
REVISED		

FIGURE 6

GRAYMONT WESTERN U.S., INC
CRICKET MOUNTAIN PROJECT
THE FINGERS
QUARRY SOILS ASSOCIATIONS



SCALE:	AS SHOWN	REVISION
JOB NO:	138408-106	
MAP NAME:	Fig6_Fingers Quarry_Soils_RSS_20080131.mxd	

Overburden piles will be constructed at the angle of repose (35 degrees or less), which by definition is a stable slope. As shown in Table 2-2 and Figure 3, the maximum height of the overburden piles will be 160 feet. Overburden piles will be visually monitored following spring snowmelt and intense rain events to ensure that drainage and sediment control measures are effective and that slopes remain stable.

3.6 Erosion Control

Erosion or altered sediment loading could occur within the permit area. BMPs will be used to control sediment, limit erosion, and reduce sediment in precipitation runoff from Project components and disturbed areas during construction and operations. Due to the area climate (discussed in Section 2.4.16), area soils types (SRK, 2007), and BMPs that will be utilized to control erosion, no impacts are anticipated from erosional processes.

BMPs may include, but are not limited to: straw bale sediment traps, diversion ditches, and rock and gravel cover. Straw bales will be used in areas where temporary erosion and sediment control measures are installed while rock and gravel cover will be utilized on permanent erosion and sediment control features. Vegetation is also a BMP and may be used as a cover to reduce the potential for wind and water erosion. Following construction activities, identified areas will be seeded as soon as practical and safe.

Sediments containing deleterious materials have not been identified and are not expected to exist at the Fingers Quarry. Material that will be excavated in the quarry is of typical carbonate composition, and the major constituents are calcite, dolomite, and silica.

Sediment and erosion control measures will be visually inspected annually or as soon as practicable following large storm or runoff events. Maintenance will occur on a regular basis and repairs performed as needed.

3.7 Air Quality

Impacts to air quality potentially include the short-term increase in fugitive dust from quarrying and hauling. Graymont will use BMPs to control fugitive dust as used in the existing operations. Methods for controlling fugitive dust, such as water application or chemical dust suppressant application on roads are specified in the air quality permit (#2700005001), which is for the Cricket Mountain Project. No permanent impacts are projected to occur to air quality. Roads will be maintained as described in Sections 2.4.6 and 2.4.18.

3.8 Public Health and Safety

The Project configuration inherently limits impacts to public health and safety; the Project description includes safety measures that protect public health and safety. Risks have been identified, analyzed, and managed to ameliorate environmental issues associated with this Project. As described in Section 2.4.15, public access to the mining and haul road area will be limited to authorized individuals only, and appropriate signage will be erected and maintained to alert recreationalists, including ATV-riders and other public, of mining activities in the area.

Warning signs will be highly visible, easy to read, and easy to understand.

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4. Reclamation and Closure

4.1 Introduction

Reclamation of disturbed areas resulting from activities outlined in this NOI will be completed in accordance with federal and state regulations. The Utah Mined Land Reclamation Act of 1975, Title 40, Chapter 8 of the Utah Code Annotated states that "Mined land should be reclaimed so as to prevent conditions detrimental to the general safety and welfare of the citizens of this state and to provide for the subsequent use of the lands affected" (40-8-2).

Reclamation and closure of the Project will be similar to that of the Cricket Mountain Mine (SRK, 1996). The Cricket Mountain reclamation plan has been developed with input from UDOGM and BLM and has been refined based on site specific operating experience over the life of the project. The reclamation and closure planning for the Fingers Project is anticipated to be an ongoing process based on Graymont's continuing experience at the Cricket Mountain Mine and other operations.

The following subsections present a discussion of conceptual reclamation and closure of the Fingers Project and associated roads. Conceptual reclamation is shown on Figure 7, and estimated revegetation areas and life-of-mine (LOM) disturbance areas are presented in Table 4-1.

Table 4-1: Estimated Revegetation Areas and LOM Disturbance Areas

Component	LOM Disturbance Area (acres)	Estimated Revegetation Area (acres)
Quarry Area	138.0	124.2
Overburden Piles	68.9	68.9
Haul Road	2.0	2.0
TOTAL	208.9	195.1

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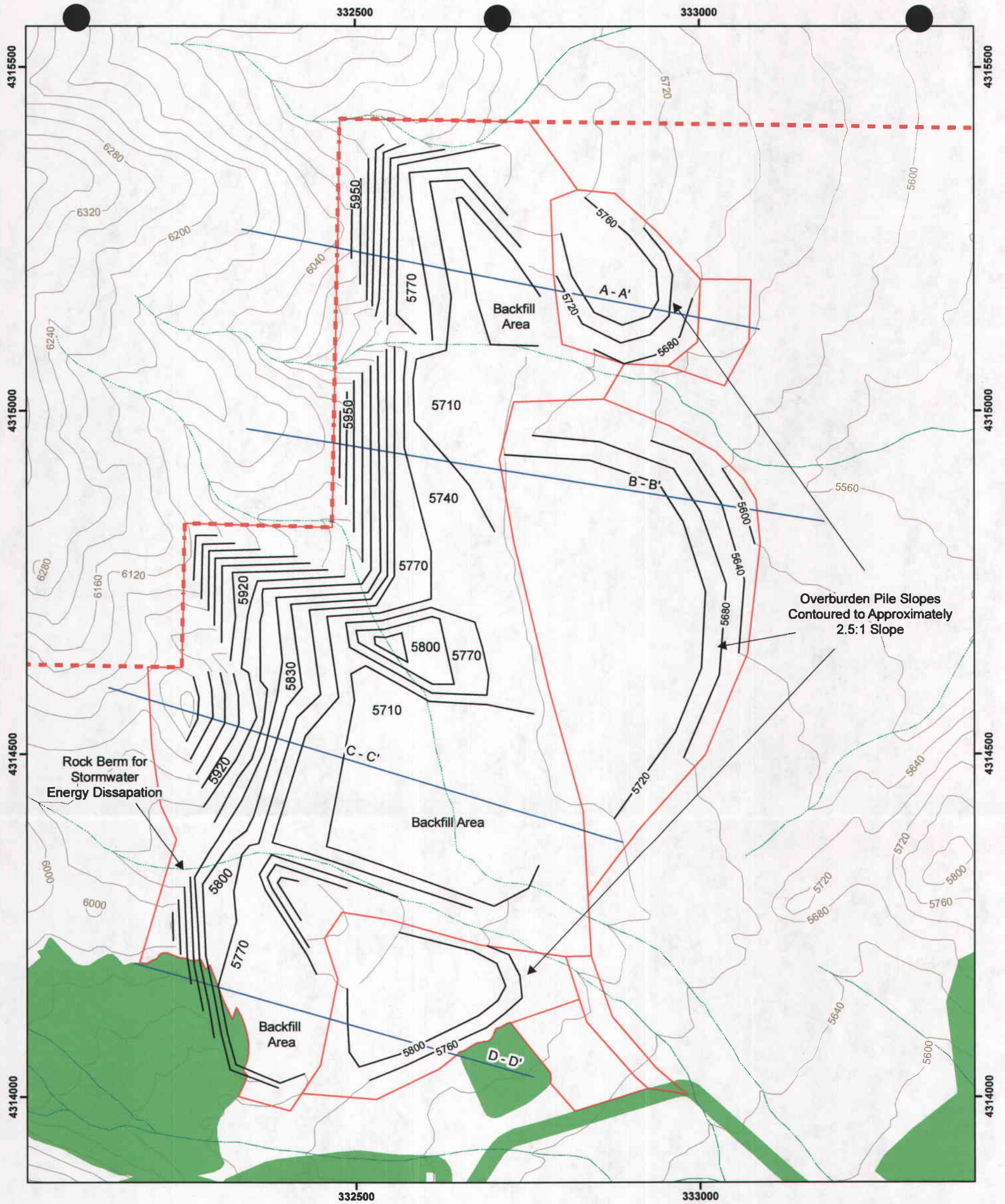


Figure 7. Fingers Conceptual Reclamation Map

Topographic Base is Candland Spring, UT (40 foot contours)

7.5' USGS Quadrangle

Quarry Bench Contours are 30 feet

Overburden Pile Contours are 40 feet

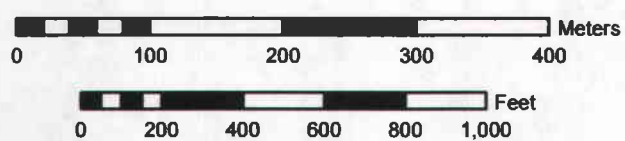
Coordinate system is UTM Zone 12N (NAD27)

Rev. August 14, 2008

Graymont Western US Inc.

- Conceptual Reclaimed Topography
- Fingers Permit Area
- Graymont Fee Land
- Cross-Section Locations
- Post-Mining Drainages
- Ephemeral Drainages
- Graymont Bonded Areas

*Disturbance areas will be revegetated to meet 70% of original vegetative cover.



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4.2 Land Uses

Major land uses occurring in the Project Area include wildlife habitat, grazing, and recreation. Following closure, the Project Area will continue to support wildlife habitat. Post-closure land use is in conformance with the Millard County zoning ordinances.

4.3 Reclamation Goals and Objectives

The goals of the Fingers reclamation program are to minimize disturbance to the environment and to restore disturbed areas similar to their pre-disturbance state. The objectives of the reclamation programs are:

- To establish surface soil conditions conducive to the regeneration of a stable plant community through stripping, stockpiling and reapplication of soil material or screened undersize limestone and dolomite material.
- To revegetate disturbed areas with a mixture of plant species in order to establish long-term productive plant communities compatible with existing land uses.
- To reclaim disturbed areas consistent with post-mining land uses.

4.4 Summary of Disturbance

The disturbance related to the NOI is discussed in Section 2.1 and is summarized in Table 2-1. The areas to be disturbed can be divided into the following categories: quarry, overburden piles, roads, and stockpiles. Graymont anticipates that roads and stockpiles will be reclaimed and revegetated as required. Bench faces in the quarry will not be reclaimed. Quarry benches and floors will be reclaimed if sufficient soil resources are available, otherwise, Graymont will request a variance.

4.5 Site Stabilization and Configuration

The Project site will be stabilized, to the extent practicable, to minimize future impacts to the environment and protect air and water resources. Stable areas of the quarry slopes will be left in place to provide nesting areas for birds and bats. Erosion will be controlled by revegetation, the placement of riprap, or other BMPs.

4.6 Site Specific Closure and Reclamation

4.6.1 Quarries

The limestone is comprised of competent material that forms cliffs in the surrounding area. Based on experience at the Poison Mountain Quarry and natural topographic features in the area, Graymont anticipates that quarry slopes constructed in limestone will be stable and left in place. Quarry slopes will be 1H:1V or shallower, and the height of the overall quarry slope will be approximately 480 feet. The quarry slopes will be benched as shown in Figure 5. No unstable areas are anticipated. Material excavated from the quarry areas will be a typical carbonate-rock composition, and the major constituents will be calcite, dolomite, and silica.

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Quarry roads, benches, and floors will be reclaimed if sufficient soils are available. Safety berms and boulders will be used to restrict access to the quarry slopes. Quarry materials will be used to create rock safety berms, where feasible. The access to benches no longer being used will also be restricted.

Warning signs will be placed where quarry slopes are located. The placement of the warning signs will be in a location that is visible from more than one viewpoint, and multiple signs will be placed in areas where signage would not be visible from more than one viewpoint.

If needed, energy dissipaters will be installed during reclamation where the larger drainage enters the quarry (Figure 7) to slow the flow of water and prevent erosion in reclaimed areas. Water that enters the quarry will soak into the benches or backfill areas or evaporate from puddles. Energy dissipaters may include a berm of sized rock or other appropriate measures.

4.6.2 Roads

Roads that are used to access disturbed areas during reclamation will be graded as necessary.

Haul road disturbance associated with this permit will be reclaimed. Reclamation for haul roads will include regrading and scarifying compacted surfaces to a depth of at least two feet. The distance between the ripper shanks will not exceed three feet.

Roads and safety berms will be recontoured or regraded to approximate the original ground surface prior to disturbance. Swales that will no longer be needed will be regraded, and unneeded culverts will be removed. Drainage crossings will be recontoured in such a manner as to be stable during normal precipitation and snowmelt events.

4.6.3 Overburden Piles

The tops of the overburden piles will be covered with a layer of soil and seeded. In some areas, the slopes on the overburden piles may be left at angle of repose in a configuration which is stable. During reclamation, sloped surfaces having the potential to experience accelerated erosion will be contour furrowed, if necessary. At this time, Graymont does not anticipate any areas that will require contour furrowing. Contour furrowing will only be conducted on overburden piles that are constructed by end dumping. Slopes of the piles that are contoured to an angle that is safe for equipment to work will be covered with a layer of soil and seeded. If sufficient soil is available, soil will be pushed from the edge of the flat areas onto the slopes to the extent safe and practical in areas where slopes are too steep for equipment to work safely. Seed will be cast from the flat areas onto the slopes to the extent safe and practical. Final slopes will be blended into the surrounding natural topography, where practical. The overburden piles will not contain deleterious or acid-forming materials.

4.6.4 Buildings, Equipment, Piping, Scrap, Reagents, and Other Materials

Portable toilets will be removed from the site during reclamation activities. Since buildings and equipment at the Poison Mountain Quarry will be utilized to support activities at the Fingers Quarry, there will be no permanent facilities or reagents at the Fingers Quarry that will require removal during reclamation activities.

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4.6.5 Drill Holes

Drill holes drilled as part of mining activities will be plugged in accordance with UDOGM rule R647-4-108.

4.7 Soil and Vegetation

The thickness of soil used during reclamation of the Project will depend on the amount of soil available. In general, the soils within the Amtoft-Amtoft very shallow-Lodar Association are thin and contain excessive quantities of gravel (in some cases greater than 60 percent) and reach bedrock at approximately 18 inches or less (SCS 1984). Soils within the Dera-Dera sandy loam association reach bedrock at greater than 60 inches but tend to contain greater than 35 percent gravel in subsurface horizons. A site reconnaissance performed by SRK in October 2007 confirmed that soils were generally shallow. Areas potentially containing greater salvageable depths of soils were noted during the survey and are shown in Appendix B. Sodic soils were not observed although SCS (1984) data indicated that these soils may be present. Table 4-2 presents a description of the soil associations in the Project Area that could be disturbed by mining activities. Vegetation normally associated with each soil series is also included. Graymont will remove all salvagable soils within the area of disturbance.

According to the *Soil Survey of Part of the Fairfield – Nephi Area* (SCS, 1984), the disturbance area will impact soils of the Amtoft-Amtoft very shallow-Lodar and the Dera-Dera sandy loam soil associations.

4.7.1 Soil Balance

A preliminary soil balance was prepared to compare the soil quantities required for reclamation of the Fingers Project components to the quantities of soil available. For the soil balance, the following assumptions were used:

- soil will not be borrowed or imported from off-site sources;
- quarry benches and floors will be reclaimed if sufficient soil resources are available;
- portions of haul roads that extend into the quarries will be reclaimed if sufficient soil resources are available;
- an average depth of about six inches of soil will be placed on all remaining project components, where feasible (except for the soil stockpile areas), to be reclaimed.

Graymont will salvage available growth media and will apply for a variance if sufficient growth media is not found. Table 4-3 provides an estimate of the soil quantities involved.

Assuming sufficient soil is available, the overall site will be revegetated to 70 percent of the existing vegetative cover. If sufficient topsoil is not available, some areas may be ripped and seeded. Other areas may remain as bare rock, which is similar to pre-mining conditions in many areas within the Fingers permit area.

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Table 4-2: Soil Information

Soil Association	Soil Series	SAR	pH	Profile Description		Position on Landscape	Slope (%)	Depth to Bedrock (in)	Vegetation
				Depth (in)	Texture*				
Amtoft-Amtoft very shallow-Lodar	Amtoft	0-2	7.9-9.0	0-3	STXL	mountainsides	25-60	18	Utah juniper, black sagebrush, Douglas rabbitbrush, Nevada bluegrass
				3-8	STVL				
				8-18	STVL				
				18+	bedrock				
	Amtoft very shallow	0-2	7.9-9.0	0-3	GRVSL	ridges, mountainsides	15-40	10	littleleaf mountain mahogany, pinyon, Utah juniper, black sagebrush, Nevada bluegrass
				3-7	GRVSL				
				7-10	GRVSL				
				10+	bedrock				
	Lodar	0-2	7.9-9.0	0-3	GRXL	mountainsides, mountain tops	20-60	17	pinyon, Utah juniper, black sagebrush, bluebunch wheatgrass
				3-9	GRVL				
				9-17	CBVL				
				17+	bedrock				
Dera-Dera sandy loam	Dera	10-70	7.9-9.0	0-4	GRL	dissected alluvial fans	---	>60	shadscale, galleta, spiny horsebrush, Indian ricegrass, bud sagebrush
				4-20	GRVL				
				20-60+	GRVSL				
	Dera sandy loam	10-70	7.9-9.0	0-3	GRSL	dissected alluvial fans	---	>60	galleta, winterfat, Indian ricegrass, shadscale, sand dropseed, bud sagebrush
				3-14	GRVSL				
				14-60+	GRVL				

Source: SCS 1984; NRCS unpublished data

*Soil texture codes are based on the National Soil Information System classification. STXL = extremely stony loam, STVL = very stony loam, GRXL = extremely gravelly loam, GRVL = very gravelly loam, GRL = gravelly loam, GRVSL = very gravelly sandy loam, GRSL = gravelly sandy loam, and CBVL = very cobbly loam.

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Table 4-3: Soil Quantities

Disturbance Activity	Acreage	Cubic yards of recoverable soil (6-inch depth¹)
Quarry Area	138.0	111,320
Overburden Piles	68.9	55,580
Haul Road	2.0	1,600
Total	208.9	168,500

¹ The depth of soils recovered will vary throughout the Project Area and will largely depend on topography and slope position. Although pockets of deeper soil may occur, six inches depth is the estimated depth to which soils may be recovered in the Project Area and is used for calculation purposes.

4.8 Revegetation

4.8.1 Seed Mixtures

Graymont will use the successful seed mix that was used in the approved Allsop Amendment. The seed mixtures to be used may be changed if commercial seed is not available and the new mix is approved by UDOGM. The seed mix used in the Flat Iron test plots is shown in Table 4-4. Appendix B contains data regarding existing undisturbed vegetative cover in the vicinity of the Project.

Table 4-4: Reclamation Seed Mix

Seed	Percentage	Lbs PLS in 12 lbs/ac basis
Hycrest' crested wheat grass	12	1.44
Luna pubescent wheat grass	24	2.88
Bozoisky Russian wildrye	24	2.88
Koshia Prostrata	4	0.48
Yellow sweetclover	12	1.44
Shadscale - VNS	12	1.44
Fourwing Saltbrush - VNS	12	1.44

4.8.2 Mulching and Fertilization

Mulching and other amendment requirements will be based on the experimental revegetation program and the reclamation experience obtained from reclamation of the Poison Mountain area.

Monitoring and evaluation of Graymont's Poison Mountain revegetation efforts commenced in 1996. "An average of vegetation cover from ten years of data from the reference areas is 24.3% +/- 4.8%" (WP Natural Resources Consulting, Inc, 2007). Revegetation efforts took place on benches with limestone fines or growth media/topsoil media as support media for seeds. In some areas a limestone/growth media mixture was used. Treatments including mulching, fertilizing, and composting were used in the areas with limestone fines. Benches with limestone fines and one or more treatments

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ranged from less than one percent to thirteen percent vegetation cover (WP Natural Resources Consulting, Inc, 2003). Benches that contained a mixture of limestone and growth media ranged from 14 to 21 percent vegetation cover. Those areas with growth media/topsoil had vegetation cover of 34 percent (WP Natural Resources Consulting, Inc, 2003). See Table 4-5. In summary, those benches with the highest success rates contain growth media. Those areas that have a mixture of limestone fines and growth media did moderately well. Benches with limestone fines had the lowest success rates during the monitoring program. The success of various revegetation media is likely dependent on the water holding capacity of the media rather than soil amendments.

4.8.3 Seeding and Planting

Seeding methods utilized at the site will depend on many factors including the topography, soil conditions, and seed mixture. Typically, some combination of broadcast seeding, drill seeding, and hydroseeding will be used for mine reclamation. Seeding will take place in the fall, October or November. Compacted soils will be ripped to a depth up to two feet prior to seeding. Uncompacted areas requiring revegetation will be scarified as needed to create a suitable seedbed.

4.9 Reclamation Schedule

Regrading and reclamation will take place in areas permanently decommissioned prior to final closure. Final reclamation will begin after mining on all remaining disturbed areas. Reseeding will be performed in October or November, as per UDOGM guidance.

4.10 Monitoring

Monitoring will be conducted to check revegetation success and erosion control. Monitoring will take place periodically during the growing season and following extreme storm events.

Revegetation success will be determined by monitoring the amount of ground cover, and comparing this value to one or more reference areas. Revegetation will be considered accomplished as per UDOGM Mineral Reclamation Rules (R-647-4) when the revegetation has achieved 70 percent of the pre-mining vegetation cover in the reference area. The survival of the vegetation for three growing seasons following seeding will be the time-criteria for defining revegetation success.

4.11 Safety and Site Control

Warning signs will be placed near reclamation work areas as appropriate. Warning signs will be highly visible, easy to read, and easy to understand. Signs that become faded and worn will be replaced.

4.12 Concurrent Reclamation

Concurrent final reclamation will take place as soon as practical and safe after mining is completed. Portions of haul roads no longer required will also be reclaimed. Area disturbed by soil stockpiles will be reclaimed after the soil is used in reclamation of the above areas.

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Table 4-5: Benches - Growth Media, Treatments, and Vegetative Cover

Bench	Growth Media	Surficial Treatment	Vegetative Cover*
5920W	Limestone fines with growth media, growth media added in 1998	Limestone cobbles and uneven surface left	82 percent
5900W	Limestone fines with growth media, growth media added in 1998	Boulder placement, windbreak	66 percent
5880W	Six inches of growth media	Boulder placement, uneven surface	140 percent
5900W	Six to twelve inches of limestone fines with growth media	Primarily limestone fines, smooth surface	58 percent
5920W	Six to twelve inches of limestone fines with composted manure	Limestone fines and cobbles	41 percent (including two percent halogeton and cheat grass)
5880M	Six to twelve inches limestone fines mixed with growth media	Limestone cobbles, uneven surface left	54 percent
5880N	Six to twelve inches of limestone fines with composted manure	Limestone fines, smooth surface	54 percent (including three percent halogeton and cheat grass)
5900E	Limestone fines	Straw mulch, NPK fertilizer	4 percent
5940E	Limestone fines	Straw mulch, NPK fertilizer	8 to 12 percent
5940W	Limestone fines	Straw mulch, NPK fertilizer	Less than 4 percent
590W	Limestone fines	Straw mulch, NPK fertilizer	Less than 4 percent
5940NW	Topsoil over limestone fines	Hay, NPK fertilizer	95 percent (including three percent cheat grass)

Source: WP Natural Resource Consulting, Inc, 2003

*Relative to 24.3% background vegetation

4.13 Interim Reclamation

In the event that continuous, full-scale production is interrupted due to economic considerations or unforeseen circumstances, interim reclamation may be initiated. Interim reclamation is outlined below:

- *Roads:* The haul roads will receive routine maintenance.
- *Quarries:* Safety berms or fences will be placed to help restrict access to quarry areas.
- *Erosion Control Measures:* All erosion control measures and BMPs will be regularly inspected and maintained.

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5. Surety

UDOGM requires operators to provide a reclamation surety to the State. Appendix C presents the surety calculation for the Fingers Quarry. The surety estimate totals \$872,967; the spreadsheets contained in Appendix C present the surety calculations.

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6. Signature Requirement

Based on reasonable inquiry, and to the best of my knowledge, I certify that the information contained in this document is true and correct:

Michael R. Brown

Vice President, Environmental Affairs
3950 South 700 East, Suite 301
Salt Lake City, UT 84107

Date: _____

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7. References

- Archaeological Research Consultants (Arcon). (1993). *Cricket Mountain Quarry Expansion Cultural Resources Survey for Continental Lime, Inc., Millard County, Utah*, June 25, 1993.
- Archaeological Research Consultants (Arcon). (1994). *Archaeological Inventory of Cricket Mountain Quarry 1994 Expansion Plan, Tracts A & B, Millard County, Utah*, June 2, 1994.
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WP Natural Resources Consulting, Inc. (2007). *Assessment of Revegetated Test Benches and Reference Transects at the Cricket Mountain Plant*, June 2007.

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Appendix A

Cultural Resources Surveys

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1993
State of Utah

Department of Community & Economic Development
Division of State History
Utah State Historical Society

DEAD OF LAND MANAGEMENT

RECEIVED

AUG 09 1993



Michael O. Leavitt
Governor
Max J. Evans
Director

300 Rio Grande
Salt Lake City, Utah 84101-1182
(801) 533-3500
FAX: (801) 533-3503

August 3, 1993

INFO. ACTION INITIAL

Nancy Shearin
Area Archaeologist
Warm Springs Bureau of
Land Management
Fillmore, Utah 84631

Warm Springs A.M.

Operations Division

RE: Cricket Mountain Quarry Development U-93-AK-280sb

In Reply Please Refer to Case No. 93-1113

Dear Ms. Shearin:

The Utah State Historic Preservation Office received the above referenced report on July 28, 1993. The report states that seven; [42MD 1076] historic properties were recorded within the project impact area. We concur with the contractors recommendation that six of seven sites are Not Eligible for the National Register of Historic Places. Concerning site 42MD 1076, the contractor had recommend that the site is also Not Eligible. After review of the form, I am recommending to BLM that the site be considered eligible, please let me know what you think.

This information is provided on request to assist the Bureau of Land Management with its Section 106 responsibilities as specified in 36CFR800. If you have questions, please contact me at (801) 533-3555.

Sincerely,

James L. Dylmann
Compliance Coordinator

JLD:93-1113 BLM

1st survey

3579

Board of State History: Marilyn C. Parker • Dale L. Berge • Boyd A. Blackner • Peter L. Goss

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ARCHAEOLOGICAL RESEARCH CONSULTANTS

June 25, 1993

Subject: Cricket Mountain Quarry Expansion Cultural Resources
Survey for Continental Lime Inc., Millard County, Utah

Project: Continental Lime Inc. Survey (CLI-93-1)
by ARCON

Permit: Utah Antiquities No. U-93-AK-230sb
Fillmore BLM Area Office Project Permit (6-4-93)

Author V. Garth Norman

Mailing: Russ Dobson, Continental Lime Inc.
Jim Dykman, Utah State Historic Preservation Office
Nancy Shearin, Warm Springs BLM Resource Area Office
Kenneth Wintch, State Lands and Forestry

ABSTRACT

On June 7-10, 1993, ARCON conducted a cultural resources survey of two parcels of land totalling 279 acres for expansion of the Cricket Mountain Quarry in Millard County, Utah. The survey was requested by Continental Lime Inc., and detailed in the field by Mr. Russ Dobson, Plant manager, and authorized by the State Historic Preservation Office, Antiquities Section, and Fillmore BLM Area Office.

Cultural resource sites recorded during the survey consist of seven open lithic scatters with five sheep camp components, all located on BLM lands. No cultural resource sites or isolated finds were located on the State land Parcel No. 1. Sparse prehistoric remains on some sites may be due in part to impacts from the sheep camps as well as erosion. Based upon strategic locations, limited lithic remains, and absence of cultural deposition confirmed by shovel testing, all sites are judged to be lithic knapping and temporary seasonal hunting and/or kill butcher stations. All sites lack potential for yielding further significant cultural data, and lack National Register potential quality. ARCON recommends a cultural resources clearance be granted to Continental Lime Inc.

232 East 300 North
American Fork, Utah 84003
(801) 756-3112

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U.S.	1	For BLM Use Only
Department of the Interior	1	BLM Report ID No.
Bureau of Land Management	1	
Utah State Office	1	Report Acceptable Yes <u> </u> No <u> </u>
	1	Mitigation Acceptable Yes <u> </u> No <u> </u>
Summary Report of Inspection	1	Comments: <u> </u>
for Cultural Resources	1	

1. Report Title: Cricket Mountain Quarry Development
 2. Development Company: Continental Lime Inc.
 3. Report Date: 6-25-93 4. BLM Antiquities Permit No. 93Ut576532
 SHPO Project No. U-92-AK-230sb
 5. Responsible Institution: ARCON. County: Millard
 6. Fieldwork Location: Parcel No.2 BLM lands, TWN 21S, Range 10W,
 Sects 23,24,25,26,35; Parcel No.1 State land, TWN 21S, Range 10W,
 Sec 36 (CRM survey expanded to 40 acre cadastrally definable area.)

7. Resource Area: Warm Springs (Fillmore)

8. Description of Examination Procedures: The survey was conducted by archaeologists walking parallel or zigzag transects about 15 meters apart. Areas of higher site potential (ridges, saddles, benches, rock outcroppings) were examined more intensively. Potential camp sites were shovel tested for cultural deposition.

9. Linear Miles Surveyed: None 10. Inventory Type: I
 Legally Definable Acres Surveyed: 280

11. Description of Findings: No sites 12. Number Sites Found: 7
 were identified on State section 36. 13. Collection: N
 (See page 2.)

14. Actual/Potential National Register Properties Affected: None

15. Literature Search, Location/date: SHPO, 6-3-93; Fillmore Warm Springs Area Office 6-4-93. A review of the State Historic Preservation files, and the Warm Springs Resource Area Office files with Nancy Searim indicate no prior cultural resource inventories or sites are located in or near the project area.. A paleontological records search was also negative.

16. Conclusions/Recommendations:

While none of the sites individually have National Register quality, collectively they have some importance as a first insight into construction of a Cricket Mountains regional prehistory study involving subsistence hunting gathering strategies. The fact that so many of the prehistoric hunting sites were also selected for sheep camps seems to reflect a common human psychology that might be of some interest for future study.
 (Continued on page 3.)

17. Signature *V. Smith*

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11. (cont'd). Cultural resource sites recorded during the survey consist of seven open lithic scatters with five sheep camp components. Sparse prehistoric remains on some sites may be due in part to impacts from the sheep camps as well as erosion. Based upon strategic locations and limited lithic remains, all sites are judged to be temporary seasonal knapping and/or hunting kill butcher stations without cultural deposition.

Site 42Md1074--Lithic scatter/sheep camp. Located at the head of a finger ridge mouth of a major draw. Obsidian, chert and siltstone debitage, with a knife tip, scrapers, and retouched utilized flakes, indicate both lithic manufacture and butchering activity. Double solder milk cans date from the turn of the century. Artifacts include a medicine bottle, a variety of tin cans, broken glass, stove grate, horse shoes, and an electric wire porcelain insulator. Shovel tests confirm absence of cultural deposition. Site lacks National Register quality.

Site 42Md1075--Lithic scatter/sheep camp. Sparse lithics located at the mouth of a major draw include retouched utilized flakes, a thumb scraper, and flakes of obsidian and quartzite. Sheep camping from around the turn of the century is indicated by a double solder milk can, and broken purple and blue glass, and a U.M.C. 44 S&W rim fire cartridge casing. Tin cans and a pop bottle cap date to the 1950's. Shovel tests confirm absence of cultural deposition. Site lacks National Register quality.

Site 42Md1076--Lithic scatter/sheep camp. A lithic scatter located on a saddle at the head of a draw includes a projectile point preform (possible Humbolt type), biface knife base, and retouched utilized flakes. Limited sheep camping remains include a milk can, tobacco can, and a beer bottle. Shovel tests confirm absence of cultural deposition. Site lacks National Register quality.

Site 42Md1077--Lithic Scatter. A lithic knapping, hunting kill butcher site located at the toe of a finger ridge consists of sparse obsidian flakes. Tools are limited to retouched utilized flakes. Site lacks National Register quality.

Site 42Md1078--Lithic Scatter/sheep camp. A sparse lithic knapping and hunting station is located at the toe of a small ridge at the confluence of two intermittent drainages. Sparse lithics consist of retouched utilized flakes and tertiary flakes. Sheep camp remains are limited to a lard can, tobacco can and cut fire wood. Site lacks National Register quality.

Site 42Md1079--Lithic Scatter/sheep camp. Located on a saddle pass at the head of two major draws. Visible remains on this extremely eroded site consist of fragments of a sandstone slab metate, two point fragments, two retouched utilized flakes, tin cans, and chopped fire wood. Shovel tests confirm absence of cultural deposition. Site lacks National Register quality.

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Site 42Md1080--Lithic Scatter. Knapping, hunting kill butcher site located at the toe of a finger ridge at the confluence of two major draws. Obsidian tools include biface and point fragments, and retouched utilized flakes. Site lacks National Register quality.

Discussion

In addition to the seven sites recorded, four isolated retouched utilized flakes of obsidian were identified. (See map.)

Site 42Md1079 is the only site that contains grinding stone, which is almost certainly related to hunting gathering activity in this strategic saddle location rather than camping. Similar hunting gathering sites identified by ARCON in Iron County often include ceramics. Absence of ceramics at these sites suggests a pre-ceramic Archaic period. The projectile point preform on site 42Md1076 of a possible Humboldt variety would also be indicative of the Archaic.

16. (Cont'd) The survey included a reasonable boundary overlap in areas of some site potential where vehicle traffic is likely to occur during development. All sites are peripheral and might be avoided, but will probably be impacted due to their locations in natural traffic corridors and proximity to slopes that will be strip mined. Consequently, the BLM way wish to consider the potential value of some additional data recovery for lithic resource evaluations including obsidian trace analysis prior to anticipated impacts. There is always a possibility that diagnostic point bases might be covered by shallow wind blown erosion, but this does not warrant excavation. Shovel tests on potential camp sites (42Md1074, 43Md1075, 42Md1076, 42Md1079) were all negative, and revealed shallow wind blown soil over steril rocky soil.

These interests for further study are not within required National Register mitigation concerns, so any further study if pursued should be done without delay with the developer's cooperation, and should not impose additional cost or delay to Continental Lime Inc. development.

ARCON recommends that Continental Lime Inc. be granted a cultural resource clearance for this project, with the following recommended stipulations:

1. That all construction activity be confined to the areas surveyed.
2. That construction personnel refrain from collecting or otherwise disturbing unrecorded cultural materials that might be encountered during development.
3. That construction activities cease and a qualified archeologist be notified immediately if unrecorded cultural materials are encountered.

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Hintze, Lehi F.

1980 Geological Map of Utah. Utah Geological and Mineral Survey. Salt Lake City.

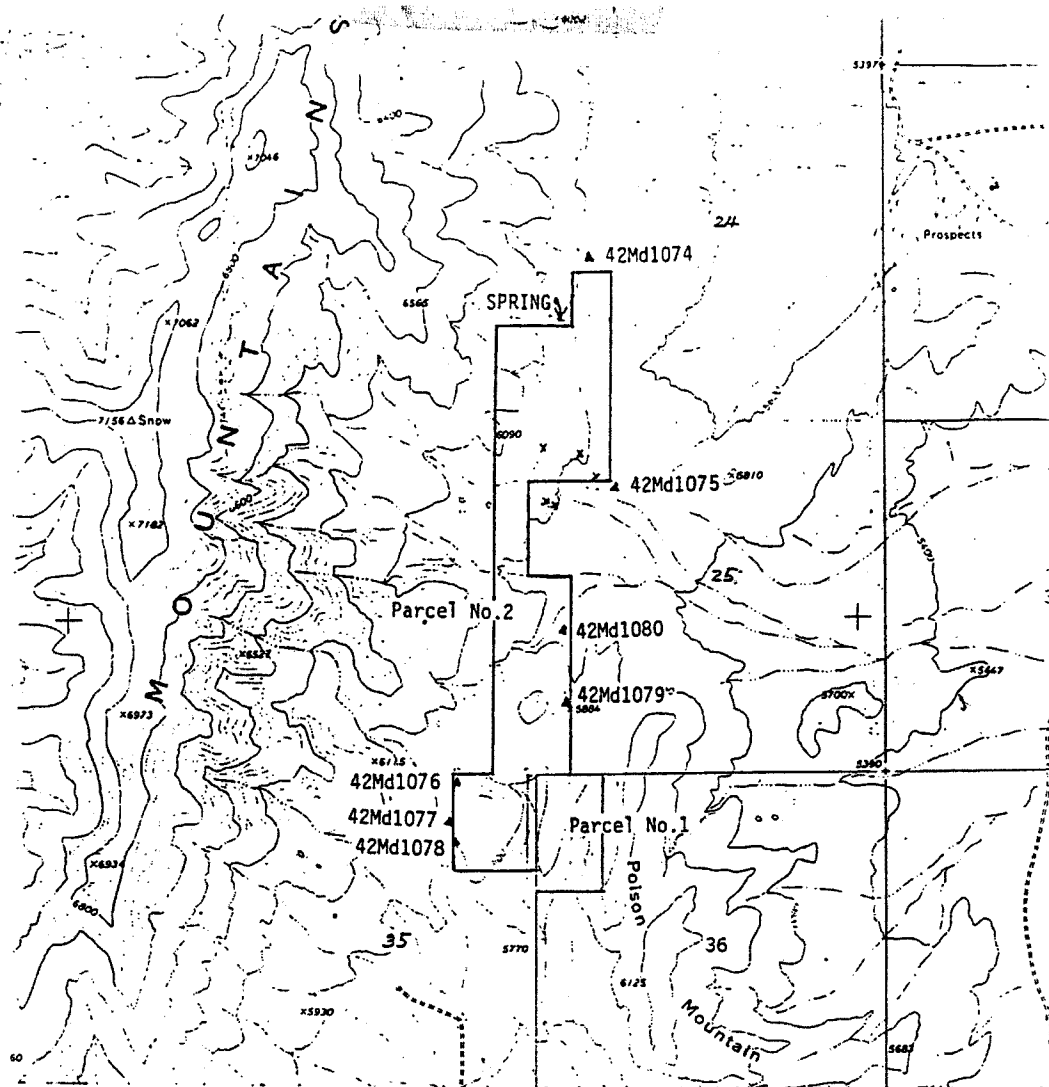
Stokes, William Lee

1977 Subdivisions of the Major Physiographic Provinces in Utah. Utah GEOLOGY 4(1). Utah Geological and Mineral Survey. Salt Lake City.

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Project Map: Continental Line Inc
 Cricket Mountain Quarry Expansion
 Project: ARCON (CLI-93-1)
 County: Millard, Utah
 Location: T 21 South, R 10 West
 USGS Quad: Candland Spring 7.5'

Key: ▲ Archaeological Site
 X Isolated flake

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1994a
ARCHAEOLOGICAL RESEARCH CONSULTANTS

RECEIVED

JUN 03 1994

INFO. ACTION

Warm Springs A.M. _____

Warm Springs A.M. _____

June 2, 1994

Mr. Vic Kastner, Quarry Supervisor
Continental Lime Inc.
Cricket Mountain Unit
P.O. Box 669
Delta, Utah 84624

Re: Continental Lime Inc. Cricket Mountain Quarry 1994 Expansion
Cultural Resources Survey in Millard County, Utah

Dear Mister Kastner:

As per your request ARCON has conducted a cultural resources inventory of two land Tracts A & B totaling 390 acres in the Cricket Mountain Quarry area of Millard County, Utah.

The survey areas were completed May 16-19, 1994. Eight cultural resource sites were identified and evaluated during the survey, along with one site previously recorded by the BLM archaeologist in Tract A. A copy of ARCON's report is attached and copies have been forwarded to the Fillmore BLM Area Office for their evaluation and the State Historic Preservation Office review.

An invoice for this work as per acreage agreement purchase order dated May 6, 1994 is enclosed for Parcels A & B. Please contact me if you have any questions.

Sincerely,

V. Garth Norman

V. Garth Norman
Director

Enclosure

CC: Nancy Shearim, Warm Springs BLM Resource Area Archaeologist
with copy to Jim Dykman, State Historic Preservation Office

Ind survey

232 East 300 North
American Fork, Utah 84003
(801) 756-3112

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ARCHAEOLOGICAL RESEARCH CONSULTANTS

June 2, 1994

Subject: Archaeological Inventory of Cricket Mountain Quarry 1994
Expansion Plan, Tracts A & B, Millard County, Utah

Project: Continental Lime Inc. Survey (CLI-93-1)
by ARCON

Permit: Utah Antiquities No. U-94-AK-242b
BLM Antiquities Permit No. 93Ut576532
SHPO Project No. U-94-AK-242b
Warm Springs BLM Resource Area Office (5-24-94)

Author: V. Garth Norman

Mailing: Vic Kastner, Continental Lime Inc.
Nancy Shearin, Warm Springs BLM Resource Area Office
Jim Dykman, Utah State Historic Preservation Office

ABSTRACT

On May 16-19, 1994, ARCON conducted a cultural resources survey of two parcels of BLM land totalling 390 acres for expansion of the Cricket Mountain Quarry in Millard County, Utah. The survey was requested and detailed in the field by Mr. Vic Kastner, Quarry Supervisor for Continental Lime Inc., and authorized by the State Historic Preservation Office, Antiquities Section, and the Warm Springs BLM Resource Area Office at Fillmore, Utah.

Nine cultural resource sites identified and evaluated during the survey consist of three rock shelters, an open lithic scatter, four sheep camps (one with lithics), and a previously recorded lithic scatter. The prehistoric sites have been impacted by erosion and vandalism, but still contain potential for yielding further significant cultural data, and are judged to have National Register quality potential. ARCON recommends a cultural resources clearance be granted to Continental Lime Inc. based upon avoidance of the prehistoric sites during construction.

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American Fork, Utah 84003
(801) 756-3112

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UTAH STATE HISTORIC PRESERVATION OFFICE
PROJECT SUMMARY FORM

PROJECT NAME: Cricket Mountains Quarry 1994 Expansion Plan

STATE PROJECT NO.: U94-AK-242b

SURVEY ORGANIZATION: ARCON

PRINCIPAL INVESTIGATOR: V. Garth Norman

FIELD SUPERVISOR (S): V. Garth Norman

ACREAGE SURVEYED

INTENSIVE: 390 ACRES RECON/INTUITIVE: ACRES

7.5' SERIES USGS MAP REFERENCE (S):

SITES REPORTED COUNT SMITHSONIAN SITE NOS.

ARCHAEOLOGICAL SITES

REVISITS (NO INVENTORY UPDATE) 1 43Md1115

REVISITS (UPDATED IMACS ATTACHED) 0

NEW RECORDINGS (IMACS ATTACHED) 8 42Md1121-42Md1128

TOTAL ARCHAEOLOGICAL SITES 9

HISTORIC STRUCTURES (106 SITE INFO ATTACHED) 0

TOTAL NATIONAL REGISTER ELIGIBLE SITES 5 42Md1115
42Md1123
42Md1125
42Md1126
42Md1127

CHECKLIST OF REQUIRED ITEMS

1. X 1 COPY OF THE FINAL REPORT
2. X 7.5' SERIES USGS MAP W/SURVEY/EXCAVATION MARKED
3. X COMPLETED IMACS SITE INVENTORY FORMS, INCLUDED
X PARTS A AND B OR C,
X IMACS ENCODING FORM,
X SITE SKETCH MAP,
X PHOTOGRAPHS,
X 7.5' SERIES USGS MAP W/SITE LOCATION
4. X MARKED AND LABELLED W/SMITHSONIAN SITE NUMBER
COMPLETED "COVER SHEET" W/FINAL REPORT AND FORMS

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U.S.	1	For BLM Use Only
Department of the Interior	1	BLM Report ID No.
Bureau of Land Management	1	
Utah State Office	1	Report Acceptable Yes <input type="checkbox"/> No <input type="checkbox"/>
	1	Mitigation Acceptable Yes <input type="checkbox"/> No <input type="checkbox"/>
Summary Report of Inspection	1	Comments: _____
for Cultural Resources	1	

1. Report Title: Cricket Mountain Quarry Development
2. Development Company: Continental Lime Inc.
3. Report Date: 6-2-94
4. BLM Antiquities Permit No. 93Ut576532
SHPO Project No. U-94-AK-242b
5. Responsible Institution: ARCON. County: Millard
6. Fieldwork Location: Parcel A - TWN 21S, Range 10W, Sec. 26;
Parcel B - TWN 21S, Range 9W, Sec. 30, 31.
7. Resource Area: Warm Springs (Fillmore)

8. Description of Examination Procedures: The survey was conducted by archaeologists walking parallel or zigzag transects about 15 meters apart. Areas of higher site potential (ridges, saddles, benches, rock outcroppings) were examined more intensively. Rock shelters were trowel tested for cultural deposition.

- | | |
|---------------------------------------|-----------------------|
| 9. Linear Miles Surveyed: None | 10. Inventory Type: I |
| Legally Definable Acres Surveyed: 390 | |

- | | |
|---|-------------------------|
| 11. Description of Findings:
(See page 2.) | 12. Number Sites Found: |
| | 13. Collection: N |

14. Actual/Potential National Register Properties Affected: 5

15. Literature Search, Location/date: SHPO, 5-23-94; Fillmore Warm Springs Area Office 5-25-94. A review of the State Historic Preservation files, and the Warm Springs Resource Area Office files with Nancy Shearim indicate one BLM archaeological inventory and lithic scatter recorded in the study area since ARCON's 1993 inventory (see references). A paleontological records search was negative.

16. Conclusions/Recommendations:

Three rock shelters have National Register quality, and two lithic scatters have National Register potential. It is recommended that future study of these sites compare lithics and any other remains from the open lithic sites to help construct the prehistory as part of a new Cricket Mountain regional research design involving subsistence hunting gathering strategies. This research design should be developed to initiate any future mitigation of archaeological sites that may be undertaken if construction impacts are anticipated. (See 16 cont'd below.)

. Signature V. Gentry M. [unclear]

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11. (cont'd). Cultural resource sites identified and evaluated during the survey consist of three rock shelters, two open lithic scatters, and four sheep camps (one with lithics). The prehistoric sites have been impacted by erosion and vandalism, but still contain potential for yielding further significant cultural data.

Site Descriptions

Site 42Md1121--Sheep camp. Located in Tract A off the NE point of the east ridge of Poison Mountain. This sheep camp has two extended use areas. It appears to have been used from the late 1930's or early 40's to the 50's. Scattered remains consist of a cedar hitching post, bailing wire, fire wood chips, a wagon wrack side board with nailed post, an iron arched support for a buggy or wagon canvass cover, single solder condensed milk cans, other tin cans, catsup bottle, a broken glass dish, and sawed bone. This site lacks National Register quality.

Site 42Md1122--Sheep camp. Located in Tract A west of the road off the SW point of the east ridge of Poison Mountain. This extended use camp has over 15 tin cans, including single solder and one double solder milk can, a Baking Powder can lid, fire wood chips, and a sheep bell. This site lacks National Register quality.

Site 42Md1123--Rock shelter. Located in Tract A at south base of the east ridge of Poison Mountain. This rock shelter as had apparent historic as well as prehistoric occupation. It measures 5 meters long, a meter deep, and has an arched roof a meter high at center. A trowel test exposed charcoal and burnt bone. Lithic tools consist of retouched utilized flakes, scrapers, and a decortation blade. Resource material is black, opaque, and mahogany obsidian. Historic use of the shelter is indicated by an anchor rock wrapped with bailing wire, presumably to hold a canvass cover, and a section of cord rope. Rocks piled for a wind break on the left could be either historic or prehistoric. The site contains cultural deposition and possible down slope midden deposits. This site has National Register potential quality.

Site 42Md1124--Sheep camp/lithic scatter. Located in a saddle at the head of an EW draw in the south of Tract A. Sparse remains reveal an early sheep camp with a double solder tin can. A broken cork type whisky bottle, aged blue-green, has a bottom monogram A 95. A metal button, probably from an overalls shoulder strap is engraved "Towers Wire Fastener." A black obsidian point mid section, and a turtle back scraper of snowflake obsidian indicate a probable kill butcher site in this strategic saddle. This site lacks National Register quality.

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Site 42Md1125--Lithic Scatter. Located on a saddle west of Poison Mountain. Remains of a Sparse lithic scatter, obscured by erosion and diffused over a broad saddle, consist of retouched utilized obsidian flakes and secondary flakes of black and mahogany obsidian, a turtle back scraper of snowflake obsidian, and an awl of milk white chert. The extent and strategic nature of the site warrants consideration for possible erosion cover of diagnostic cultural materials. The site has National Register potential.

Site 42Md1126--Rock Shelter. Located in Tract A west of Poison Mountain on a south facing slope at the base of a limestone cliff. This small but functional rock shelter measures 1.5 meters wide by one meter deep, with a .75 meter high ceiling, and a floor depth of about 15 cm. Trowel tests reveal decayed pack rat midden mixed with soil and frost fractured limestone shale, possibly resulting from vandalism refill. The only human remains observed consist of a beer bottle and a decoration scraper of obsidian, both just down slope from the mouth of the shelter. The site has National Register potential.

Site 42Md1127--Rock Shelter. Located near the center of Tract A west of Poison Mountain on a south facing slope rock outcrop. This shelter is very similar to shelter 42Md1126, but is twice as large, measuring 2.5 meters wide by 2 meters deep with a meter high ceiling. The site has been heavily vandalized with the vandal midden running down slope. Trowel testing revealed a partly refilled floor consisting of a mixture of decayed pack rat midden with soil and frost fractured limestone shale. Limited testing and down slope inspection failed to observe any direct evidence of human occupation, but the heavy vandalism and compared superior quality to shelter 42Md1126 is ample evidence that it was inhabited. The site has National Register potential.

Site 42Md1128--Sheep camp. Located in the north of Tract A west of Poison Mountain in a wide draw between the confluence of two washes. Remains of the camp consist of tin cans, including milk solder, vegetable, coffee, and Prince Albert cans. Fire wood chips, and a riveted leather harness strap were also observed. The site lacks National Register significance.

Site 42Md1116--Lithic scatter (previously BLM recorded). Located in a low 35 X 50 meter saddle between two rock outcrops. Lithics are multi-component material types with no diagnostics observed. Tools consist of a biface of red chert and a biface fragment of black obsidian. The site has National Register potential.

Isolated Finds

In addition to the eight sites recorded, an isolated retouched utilized flake of mahogany obsidian, and a thumb scraper of obsidian were identified and recorded as extensions of the saddle site 42Md1125. Scattered isolated finds in Tract B

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were limited to historic artifacts related to sheep herding and possible mineral exploration claims (see Map B). Tract B isolates are listed below.

Tract B Isolates

- X-1 rock cairn & metal leather sequin
- X-2 2 single solder milk tin cans
- X-3 vegetable tin can
- X-4 4 tin cans and a bottle
- X-5 7 single solder milk tin cans and a bottle
- X-6 2 tin cans and a stove pipe elbow
- X-7 double solder tin can
- X-8 Prince Albert tobacco can
- X-9 5 gal. square tin can
- X-10 tin bread can with hinged lid

Discussion

The prehistoric sites are being evaluated in conjunction with sites previously recorded in the area by ARCON and the BLM, which now total 15. Identification of these sites through Continental Lime's exploration program is beginning to develop a significant data base for helping constructing the area's prehistory, even though temporal diagnostic remains are still limited.

16. (Recommendations Cont'd) Mitigation data recovery on National Register quality sites should be considered for sites that could be impacted due to their locations in natural traffic corridors and proximity to slopes that will be strip mined. The BLM way wish to consider the potential value of some additional data recovery on lithic sites as part of a district research plan prior to anticipated construction impacts. The National Register quality potential of sites is summarized as follows:

Tract B

42Md1121	Sheep Camp	Non significant
42Md1121	Sheep Camp	Non significant
42Md1123	Rock Shelter	Significant

Tract A

42Md1124	Sheep Camp/ Lithic Scatter	Non significant
42Md1125	Lithic Scatter	Significant
42Md1126	Rock Shelter	Significant
42Md1127	Rock Shelter	Significant
42Md1128	Sheep Camp	Non significant
42Md1116	Lithic Scatter (previously BLM recorded)	Significant

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ARCON recommends that Continental Lime Inc. be granted a cultural resources clearance for this project, with the following recommended stipulations:

1. That all construction activity be confined to the areas surveyed,
2. That prehistoric sites be avoided during construction, or mitigated prior to anticipated construction impacts,
3. That construction personnel refrain from collecting or otherwise disturbing unrecorded cultural materials that might be encountered during development.
4. That construction activities cease and the BLM archeologist be notified immediately if unrecorded cultural materials are encountered.

References

Hintze, Lehi F.

- 1980 Geological Map of Utah. Utah Geological and Mineral Survey. Salt Lake City.

Jorman, V. Garth

- 1993 Cricket Mountain Quarry Expansion Cultural Resources Survey for Continental Lime Inc., Millard County, Utah.

Shearim, Nancy

- 1994 Cricket Mountain Drilling. Richfield BLM District, Fillmore Office report of 4/14/94.

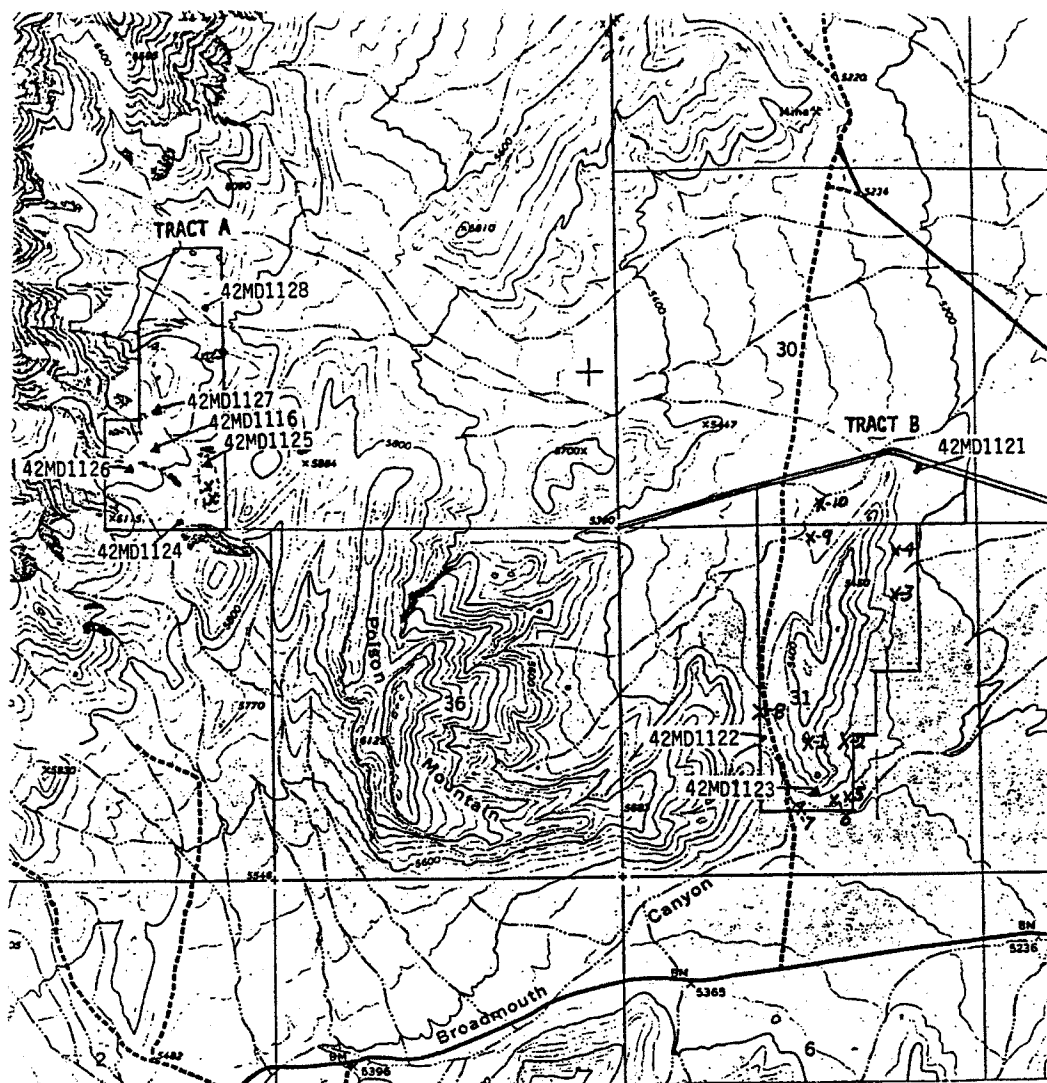
Stokes, William Lee

- 1977 Subdivisions of the Major Physiographic Provinces in Utah. Utah GEOLOGY 4(1). Utah Geological and Mineral Survey. Salt Lake City.

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PROJECT MAP

Project: Continental Lime Inc.
1994 Cricket Mountain Quarry Expansion
ARCON (CLI-94-1)
County: Millard, Utah
Location: T 21 South, R 9,10 West
USGS Quad: Candland Spring 7.5'

Key: ▲ Archaeological Site
● Historic Site
x Isolated artifact

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Appendix B

Baseline Studies for the Fingers Quarry

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**Graymont Western U.S., Inc.
Cricket Mountain Project, Utah**

**Baseline and Soils Studies for The Fingers
Quarry Project**



GRAYMONT

**Graymont Western, U.S., Inc.
3950 South 700 East
Suite 301
Salt Lake City, Utah 84107**

Prepared by:
 **SRK Consulting**
Engineers and Scientists
Steffen Robertson and Kirsten (U.S.), Inc.
1250 Lamoille Highway, Suite 520
Elko, Nevada 89801

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November 2008
SRK Project No. 138407
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**GRAYMONT WESTERN U.S., INC.
THE FINGERS QUARRY PROJECT
BASELINE AND SOILS STUDIES
MILLARD COUNTY, UTAH**

1. INTRODUCTION

Graymont Western U.S., Inc. (Graymont) operates the Cricket Mountain Mine (Mine), an existing limestone mining and processing operation, located in west-central Utah (Figure 1). The Mine consists of a limestone quarry, overburden stockpiles, screened undersize material stockpiles, haul roads, a processing plant, and ancillary facilities located on unpatented mining claims on public lands administered by the United States Department of the Interior, Bureau of Land Management (BLM), on lands leased from the State of Utah, and on private lands owned by Graymont. The general location is shown on Figure 1. The Mine received approval of its Plan of Operations from the Warm Springs Field Office in Fillmore, Utah. A Notice of Intention (NOI) for the existing Project was approved by State of Utah, Division of Oil, Gas and Mining (UDOGM) on January 1, 1981 (M/027/006). Additional NOIs have been subsequently filed.

The Mine is located approximately 32 miles southwest of the city of Delta, in Millard County, Utah. The Cricket Mountain Plant is located west of Highway 257 near Bloom Siding in Section 36, Township 21 South (T. 21 S.), Range 9 West (R. 9 W.) and Section 1, T. 22 S., R. 9 W. The existing limestone quarry can be reached by traveling six miles west of the Plant (Figure 2).

Graymont is planning exploration work in the vicinity of the existing Cricket Mountain operations. The site is north of the Poison Mountain Quarry in portions of T. 21 S., R. 10 W., Sec. 23, 24, 25, and 26 (Figure 2). This area is approximately 640 acres of the foothills of the Cricket Mountains and the valley floor.

Elevations range from approximately 5,200 feet above mean sea level (amsl) to approximately 6,000 feet amsl. The area is characterized by valley bottom and side slopes and foothills of higher mountain ranges. The side slopes and foothills are dissected by several short drainages with steep side canyons and rock outcrops are common. Vegetation across this landform consists of scattered to dense juniper trees, native bunchgrasses, forbs, and shrubs in the upper elevations. The valley floor vegetation consists of bunchgrasses, shrubs, and forbs, with widely

scattered juniper. The junipers tend to be along the drainages. Cheatgrass (*Bromus tectorum*) occurs in patches that were previously burned and as an understory grass in the shrub communities. The cheatgrass has become a component of the herbaceous layer in some portions of the foothill vegetation that was not subject to recent fires.

SRK Consulting (U.S.), Inc. (SRK) was contracted to conduct soil and baseline surveys. The soil surveys were conducted to determine if the soils present are suitable for use in reclamation. The baseline surveys were conducted to assess the important resources on the subject land. The following resources were included in the survey:

- Special status species;
- Noxious and invasive plants species;
- Soils;
- Wildlife, including raptor nest sites; and
- Vegetation.

1.1. SURVEY METHODS

1.1.1. Special Status Species

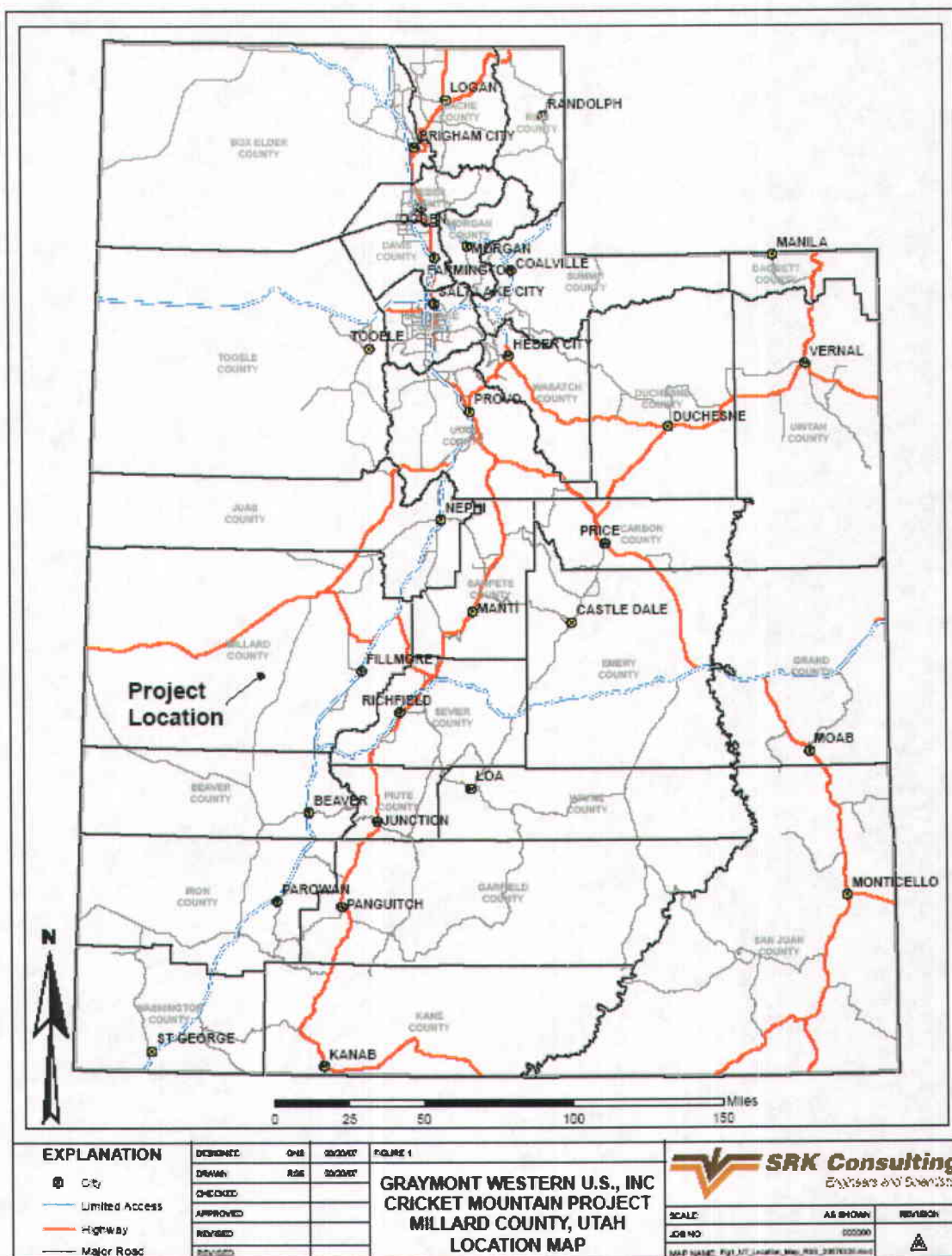
SRK checked the Utah Natural Heritage Program website to determine which special status species had potential to occur on the subject lands. This information combined with previous surveys in the area, indicated that the only species of concern were Western burrowing owls (*Athene cunicularia* ssp. *hypugaea*) and ferruginous hawks (*Buteo regalis*). The field surveys consisted of traversing the subject land to determine if any nest sites for these two species were present. In addition, the lands were searched with binoculars throughout the day to determine if either species was present during the survey.

1.1.2. Noxious and Invasive Plant Species

Due to the previous disturbance in the area (e.g., fires and exploration), the potential existed for non-native, invasive plant species to be present. SRK conducted a field survey of the subject lands to determine if any noxious and invasive plant species were present. The survey consisted of traversing the property to identify

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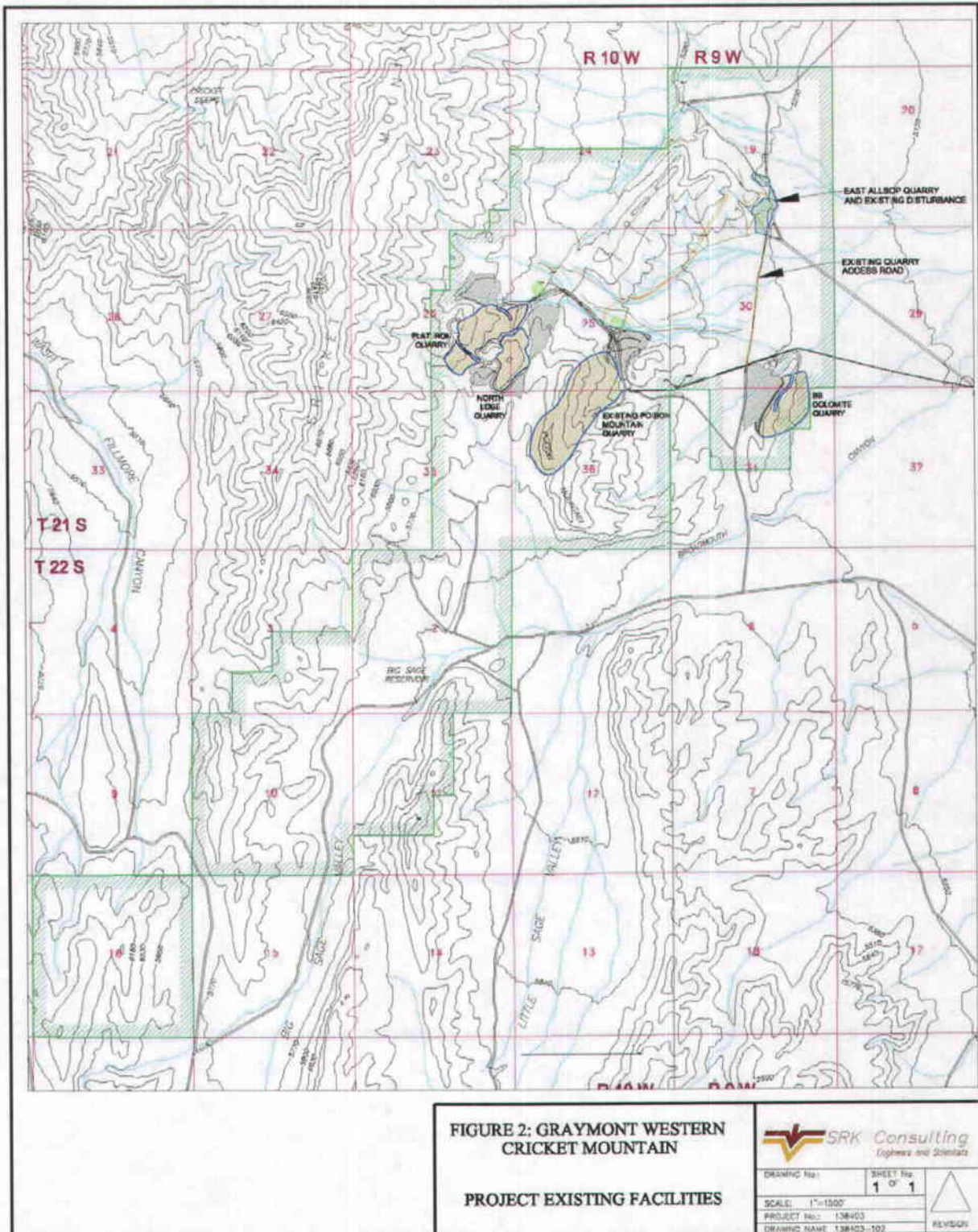
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emerging plants and remnants of last season's growth.

1.1.3. Wildlife

The area was surveyed for observation of wildlife species and/or their sign to determine which species are likely to inhabit the subject lands. Of particular interest were potential raptor nesting habitat, such as rock outcrops/ledges, juniper trees, ground nesting sites, and burrows.

1.1.4. Vegetation

The vegetation or plant communities were determined during the site visit. The dominant plant method was used to describe the various plant communities.

As part of the baseline reference for reclamation activities, point-intercept transects were established in the subject lands. Transects were placed parallel to the contours on steep slopes and spaced throughout the subject lands to sample the various plant communities.

1.1.5. Soils

Prior to conducting the site visit, SRK contacted the NRCS office in Richfield, Utah to obtain NRCS soil survey data. This data consisted of unpublished survey data which has not been verified by NRCS. Based on the soil map units provided by the NRCS, SRK selected random points for digging soil pits and collecting soil samples.

The soil survey was conducted on October 25 and 26, 2007. One soil sample was collected and one soil pit was prepared. There were two soil types present within the Project area. The Dera-Dera sandy loam Association was sampled. However, the Amtoft-Amtoft very shallow-Lodar Association was not sampled because where present, it was extremely rocky and depths were quite shallow due to the extensive bedrock outcropping.

The soil pit consisted of excavating soil down to a restrictive layer (e.g., bedrock, duripan, or large cobble layer). The depth to the restrictive layer, vegetation at the site, and soil description were recorded.

The soil sample consisted of at least 800 grams of soil material. The sample material was obtained by taking a vertical "slice" of the pit wall from the surface to the bottom of the pit and placing the material in one-gallon zip-lock bags for transportation back to the soil lab. The sample was

then weighed, dried in an oven and re-weighed to determine moisture content. The dried soils were then subjected to a sieve analysis, which determined the various sized materials in the sample.

Soil pH was not collected in the field. The vegetation at the sample sites was used as an indication of pH problems. Most plants are tolerant of pH values between 6.1 and 7.8. Outside of this range, the plant community shows significant changes in species composition (i.e., acid- or alkaline-tolerant species).

2. RESULTS

The field survey was conducted on October 25 and 26, 2007. SRK personnel were on site for approximately 20 man-hours. Weather during the survey varied from clear and warm to cool and windy.

2.1. SPECIAL STATUS SPECIES

The BLM has designated a limited use area to protect ground nesting raptors; this area includes the Allsop Quarry, Flat Iron, and Poison Mountain Quarry sites, as well as The Fingers Project area. This designation restricts motorized vehicle use to designated roads and trails from March 1 to June 30. Ferruginous hawk is the primary species afforded protection by this limited use designation.

During the on-site survey, one golden eagle (*Aquila chrysaetos*) adult and one bird of the year were observed on the site. Both were observed soaring overhead. Suitable nest sites for this species occur on the east side of the valley within limestone cliffs, which are outside of the Project boundary. The Fingers Project area does not include extensive nesting sites for this species.

Ferruginous hawks nest on the ground, in shrubs, and in juniper trees. When nesting in juniper trees, they often select trees at the end of a "finger" or stringer of trees extending out into a valley on an alluvial fan. The use of dense woodlands is not common. Therefore, the search for nests for this species was conducted primarily in the stringers of juniper extending into the valley. A portion of the high elevation, dense woodland was also surveyed for other raptor nests.

None of the junipers extending into the valley were observed to have raptor nests. No ferruginous hawk nests were found during the field survey. No stick nests were observed in the dense woodland that was surveyed. However, given the size of the woodland area and the density of trees, an

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aerial survey during the nesting season would be required to determine nest locations.

Burrowing owls nest in abandoned burrows created by other burrowing animals. The soils on much of the area were too shallow to bedrock to provide suitable habitat for this species. Within the valley bottom, soils were sufficiently deep, but very rocky and coarse. Burrows observed during the survey did not reveal any active burrowing owl nests on the subject lands.

There are many cliff rock outcrops in the area adjacent to The Fingers Project area and in the general vicinity. These cliffs provide potential nest habitat for golden eagles and prairie falcons (*Falco mexicanus*). No nests for either of these species were observed during the survey.

Bat roosting habitat in the form of caves was not observed within the subject lands. The limestone cliffs and rock outcrops within the vicinity of the Project area had several caves in the exposed rock cliff/rock outcrop areas which provide potential bat habitat. These cliffs and caves are not scheduled for disturbance, and the caves were not examined for depth, air flow, or other factors that make them suitable as bat habitat as they were out of the survey area. The lack of water on the subject lands reduces the variety of foraging habitat for bats, as does the abundance of cheatgrass in the valleys.

No special status species of plants were observed on the subject lands during the field survey. Some of the area has been previously burned and converted to cheatgrass, including areas of cheatgrass monoculture. These areas that have converted to cheatgrass have lost most of the native vegetation, and special status plants were not anticipated or found in these areas. The remaining unburned vegetation did not include any special status plants.

2.2. NOXIOUS AND INVASIVE PLANT SPECIES

Noxious weeds were not observed during the site survey. While the area was free of noxious weeds, cheatgrass was dominant in the valleys, the main component of the grassland or cheatgrass community. Cheatgrass was the main component of the annual grassland or cheatgrass community, a major component of the black sagebrush with scattered juniper community, and the big sage and black sage, with juniper community, and present in the Utah juniper community.

2.3. WILDLIFE

Species or their sign that were observed during the site visit included mule deer (*Odocoileus hemionus*), golden eagle, common raven (*Corvus corax*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), mountain bluebird (*Sialia currucoides*), coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), mountain cottontail (*Sylvilagus nuttallii*), packrat (*Neotoma sp.*), whitetail antelope squirrel, (*Ammospermophilus leucurus*), pronghorn antelope (*Antilocapra americana*), and sagebrush lizard (*Sceloporus graciosus*). Several other lizards were observed on site but were not identified to species.

No live waters were observed on the site, limiting the use of the area by most wildlife species. However, a wildlife guzzler was observed in the southwest portion of the Project area adjacent to an ephemeral drainage.

2.4. VEGETATION

Four major plant communities occurred on site (Figure 3). The higher elevation sites in the foothills and along ridge tops were primarily Utah juniper (*Juniperus osteosperma*). Cheatgrass, although present, was a minor component of this community. No transects were conducted within this vegetation type due to the density of Utah juniper and the lack of shrubs and grasses in the understory.

The foothills consisted of a transition community of black sagebrush (*Artemisia nova*) with scattered Utah juniper. Black sagebrush was the dominant shrub community. Needlegrass (*Hesperostipa sp.*) was the dominant perennial grass in this community. Big sagebrush (*Artemisia tridentata spp. vaseyana*), ephedra (*Ephedra viridis*), and bluebunch wheatgrass (*Pseudoroegneria spicata ssp. spicata*) were also observed in this community. Cheatgrass, although present, was a minor component of this community.

The valley floor community that had not previously burned consisted of big sagebrush and black sagebrush with scattered juniper. This community was invaded by cheatgrass. Most of the valley consisted of this type prior to being burned. Big sagebrush was the dominant shrub in this community. Indian ricegrass (*Achnatherum hymenoides*) and needlegrass were the dominant perennial grasses in this community. Black sagebrush, green rabbitbrush (*Chrysothamnus viscidiflorus*), shadscale (*Atriplex confertifolia*), prickly pear cactus (*Opuntia sp.*), bluebunch wheatgrass, vetch (*Astragalus sp.*), bluegrass (*Poa sp.*), galleta grass (*Pleuraphis*).

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jamesii), and ephedra were also observed in this community.

The plant community in the burned area of the valley floor was the annual grassland or cheatgrass community. This type was dominated by cheatgrass. Indian ricegrass, bottlebrush squirreltail (*Elymus elymoides*), bluegrass, and galleta-grass were the perennial grasses found in this altered plant community. The fuel continuity in this community was continuous. The potential for fire in this community is high, and this plant community has contact zones with the other plant communities. Consequently, the entire survey area is at risk for wildfire.

The disturbed area consists of unvegetated mining activities. No transects were conducted within this

vegetation type due to the absence of vegetation within the facility.

The mean total cover for the project area is 34.5 percent with a mean of 26.8 percent perennial cover. The fuel continuity of the annual grassland or cheatgrass community was continuous, as were portions of the Utah juniper community. The big sagebrush, black sagebrush, and scattered juniper community is typically not a high risk community because of the large interspaces between plants (i.e., fuel discontinuity). However, the presence of cheatgrass in the interspaces has changed the fuel distribution such that this plant community is now susceptible to range fires under normal, late season conditions. Consequently, the entire survey area is at risk for wildfire. A list of the species observed is included in Table 1.

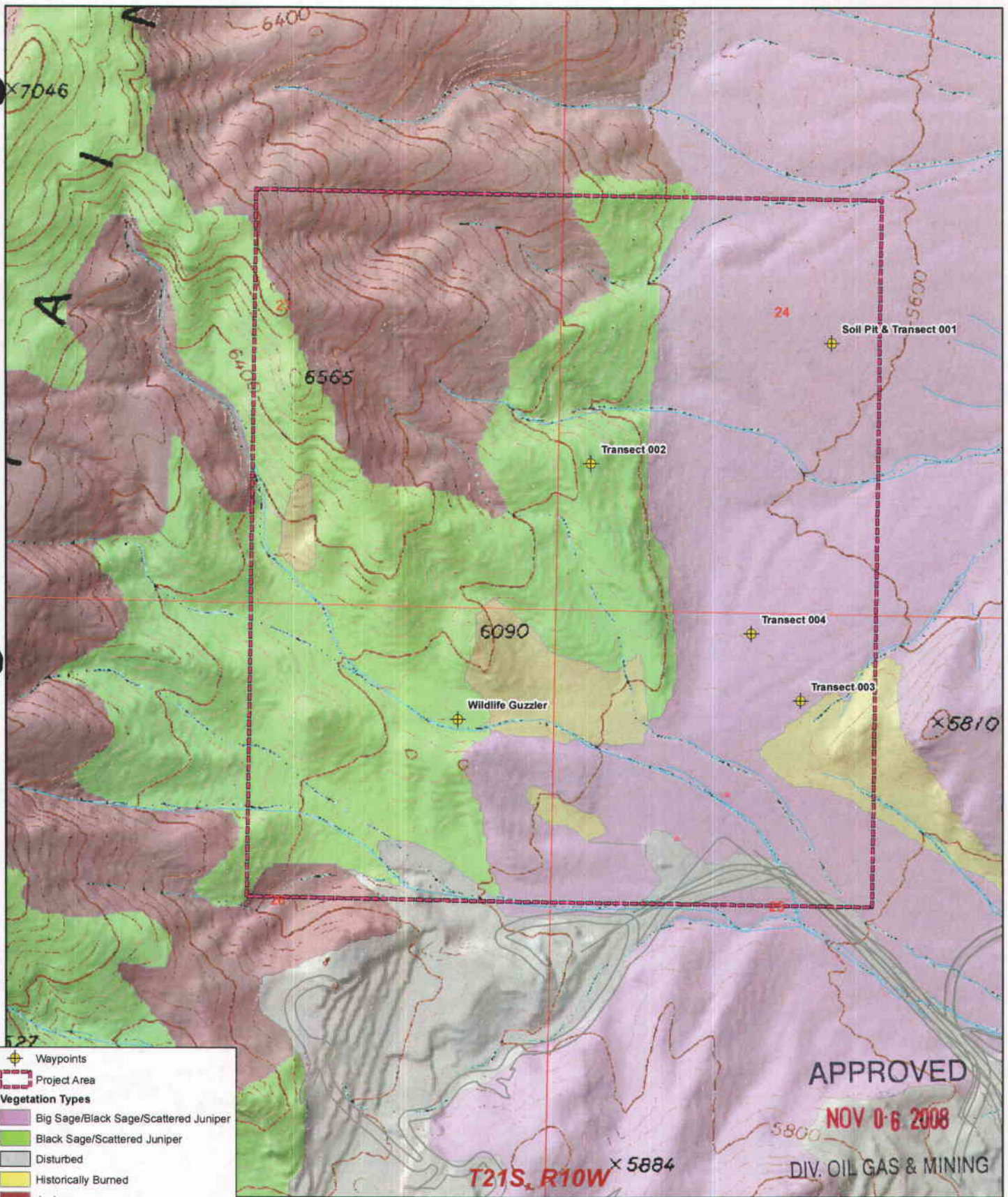
Table 1: Cover Estimate for the Project area.

GROUND COVER	TRANSECTS				
	Percent Cover				
	001	002	003	004	Mean
Bare Ground	47	36	28	58	42.3
Litter	19	18	25	7	17.3
Rock	6	9	3	6	6
Subtotal	72	63	56	71	65.5
Grasses					
Indian Ricegrass	2	0	4	2	2
Cheatgrass	8	7	13	3	7.8
Bluegrass	0	3	0	1	1
Saltgrass	0	0	1	0	0.3
Needleandthread	0	0	8	0	2
Bluebunch Wheatgrass	0	15	0	0	3.8
Subtotal	10	25	26	6	16.8
Shrubs					
Black Sagebrush	0	10	5	12	6.8
Shadscale	0	0	3	3	1.5
Winterfat	0	0	3	0	0.8
Ephedra	1	1	0	0	0.5
Big Sagebrush	16	1	5	0	5.5
Rabbitbrush	0	0	2	8	2.5
Prickly Pear	1	0	0	0	0.3
Subtotal	18	12	18	23	17.8
Totals					
Total Cover	28	37	44	29	34.5
Perennial Cover	20	30	31	26	26.75

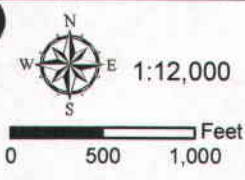
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- Waypoints
- Project Area
- Vegetation Types**
 - Big Sage/Black Sage/Scattered Juniper
 - Black Sage/Scattered Juniper
 - Disturbed
 - Historically Burned
 - Juniper



DESIGNED	GNB	10/29/07
DRAWN	RSS	11/05/07
CHECKED		
APPROVED		
REVISED		
REVISED		

FIGURE 3

GRAYMONT WESTERN U.S., INC
THE FINGERS PROJECT
GENERAL VEGETATION MAP

SRK Consulting
 Engineers and Scientists

SCALE: AS SHOWN		REVISION
JOB NO: 138407		A
MAP NAME: Fig3_Fingers_Veg_RSS_20071029.mxd		

2.5. SOILS

2.5.1. NRCS Information

The NRCS unpublished soil survey included two soil associations for the Project area. The Amtoft-Amtoft very shallow-Lodar Association, 15 to 60 percent slopes (Map Unit 2) and the Dera-Dera sandy loam Association, 2 to 8 percent slopes (Map Unit 16) (Figure 4).

In general, the soils within the Amtoft-Amtoft very shallow-Lodar Association, 15 to 60 percent slopes are thin and contain excessive quantities of gravel (in some cases greater than 60 percent) and reach bedrock at approximately 28 inches or less (NRCS 2006, unpublished). This soil type is well drained, slightly alkaline, and has a slope range of 15 to 60 percent. The association is found above the valley floor over bedrock and has angular cobble-sized material in addition to the gravel content. The deepest soils of this association are found on the convex slopes. The shallow soils favor black sagebrush and Utah juniper over Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*).

Soils within the Dera-Dera sandy loam Association, 2 to 8 percent slopes reach bedrock at depths of 60 inches but tend to contain greater than 35 percent gravel in subsurface horizons. This soil type is well drained, slightly alkaline, and has a slope range of 2 to 8 percent. The Dera-Dera sandy loam association is located on the valley floor areas and at the mouths of the short canyons. The soils of this association are fairly suited for use in reclamation; however, they are currently occupied by cheatgrass, either as a dominant species or an understory component. Consequently, salvage of these soils is also likely to transport cheatgrass seed to the stockpiles, facilitating the establishment of cheatgrass during reclamation.

2.5.2. Field Survey

Soil samples from soil pits established in the Dera-Dera sandy loam Association, 2 to 8 percent slopes elsewhere in the Cricket Mountain Project area were similar to the soil sample collected at The Fingers. The soil sample collected during this survey included a high percentage of gravel (50 percent), as well as sand (50 percent) and silt (0.3 percent) (Appendix B). Because of the limited silt/clay content, the water holding capacity is low. Therefore, even though this soil may be deep in some locations, it is a droughty soil.

3. RECOMMENDATIONS

3.1. SPECIAL STATUS SPECIES

No modification of the proposed project is necessary with respect to special status species. No special status plant or animal species (or their sign) were observed during the survey.

If vegetation removal is to occur during the raptor nesting season, an aerial nest survey should be conducted of the juniper woodlands.

3.2. NOXIOUS AND INVASIVE PLANT SPECIES

The area was weed free; however, the disturbance created by the quarry development would provide suitable seedbed conditions for many noxious weed species. Therefore, the area should be monitored annually to ensure any new noxious weed infestations are identified and treated before they have an opportunity to expand.

3.3. WILDLIFE

Removal of vegetation should be conducted between August 1 and March 30 to avoid possible violations of the Migratory Bird Treaty Act. This act prohibits the taking of migratory birds, their nests, eggs, or young. Therefore, all grubbing should take place in the non-nesting season.

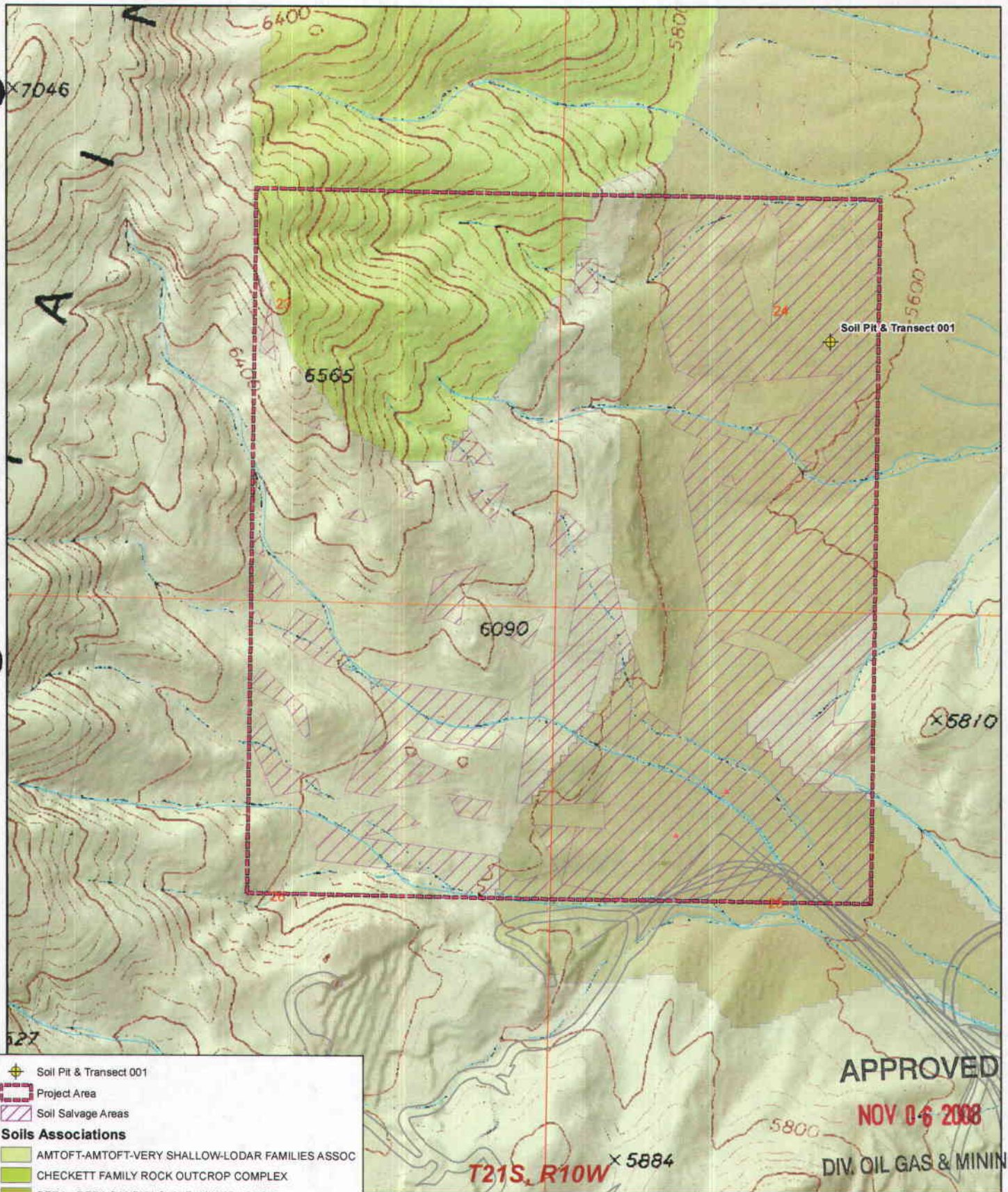
The wildlife guzzler observed in the southwest portion of the Project area should be removed prior to disturbance if the guzzler is located in an area that will be disturbed.

3.4. VEGETATION

Graymont has had success with the seed mix used for reclamation of the Flat Iron Project, and SRK recommends that this mix be used for reclamation of the subject land as well. Due to the amount of cheatgrass in the Project area, the species in this mix are likely to establish, albeit in combination with cheatgrass. Use of the salvaged soil will provide a growth media suitable for these species. Other species may be added to the reclamation seed mix, but the species specified in the seed mix will provide the pre-mining land uses and stabilize the site following exploration.

3.5. SOILS

Both of the soils observed during the survey are basically suited for use in reclamation. The major limiting factor for all of the soils was the amount of sand and gravel relative to the fines. The presence of the gravels (and stones) has potential to limit the



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1:12,000

0 500 1,000 Feet

DESIGNED	GNB	10/29/07
DRAWN	RSS	11/05/07
CHECKED		
APPROVED		
REVISED		
REVISED		

FIGURE 4

GRAYMONT WESTERN U.S., INC
CRICKET MOUNTAIN PROJECT
THE FINGERS PROJECT
SOIL ASSOCIATIONS AND
SOIL SALVAGE AREAS



SRK Consulting
Engineers and Scientists

SCALE:	AS SHOWN	REVISION
JOB NO:	138407	
MAP NAME:	Fig4_Fingers_Soils_RSS_20071105.mxd	



ability to drill seed into these growth media when redistributed over recontoured facilities. However, both soils supported vegetation with relatively high production (400 to 800 lbs total dry weight production, NRCS unpublished data). Similarly, none of the soils in the survey area were rated as having high salinity, nor did the vegetation present indicate high salt values. Shadscale and some other salt desert shrubs were present, but not as dominant species, indicating moderate salt content. The presence of black sagebrush and Wyoming big sagebrush on the sites was also an indication that the soils were not saline. The vegetation also confirmed that NRCS unpublished data that indicated the pH was slightly alkaline, which is expected given that the soils are derived from limestone. However, the pH values provided by NRCS were in the 7.9 to 9.0 range.

Figure 4 shows the areas with potential for soil salvage. The area depicted in the figure was based on slope and distance from rock outcrops, where the soil is likely to be shallow. Generally, salvage areas include locations where the slope is less than 15 percent and the areas are 100 feet or more from outcrops. Suitable soils occur in the remaining portions of the survey area; however, the volume per acre is likely to be low, the percent of large rocks is likely to be high, and the steepness of the slopes may interfere with safe salvage.

With respect to soil salvage, SRK recommends that at least 12 inches of soil be salvaged from all sites where disturbance is proposed, unless the depth to bedrock is less than 12 inches. Where soil is being salvaged from the valley floor, at least 18 inches is likely to be suitable for salvage and more in some locations.

Where the native vegetation is present, the following can be used as a guide:

- Wyoming big sagebrush is the dominant vegetation – salvage up to 24 inches;
- Black sagebrush is the dominant vegetation (or co-dominant with juniper) – salvage up

to 18 inches (a duripan may occur before the 18-inch depth, in which case, salvage everything above the duripan); and

- Avoid salvaging boulders and large cobble as they will make seeding difficult after growth media redistribution.

Where the native vegetation has burned and been replaced with cheatgrass, consider the following:

- Assume 18 inches of salvageable material, but scrape deeper to determine the maximum salvageable depth. Because the cheatgrass is primarily on the valley floors, additional soil may be available;
- Scrape off the top two inches of soil and put off to the side. This material will contain the cheatgrass and cheatgrass seed and should not be used as direct haul material for reclamation (this material could be used for berms or delineating the toe of waste rock stockpiles). The cheatgrass-containing soil should be placed where it will be covered by the salvaged soil stockpile, covered by waste rock material, or placed in the bottom of completed quarries. When covered by the soil stockpile or waste rock, the seed will not have an opportunity to germinate, and will lose its viability over time, eliminating this source of seed. By placing in the bottom of existing quarries, the seed may germinate but the long-term protection from fire or other surface disturbance may result in a nitrogen deficit which would create conditions where other perennial grasses can establish and eventually co-dominate with cheatgrass.

In all cases, stockpiled growth media should be seeded with crested wheatgrass or other aggressive species to prevent the stockpiles from becoming infested with cheatgrass. This will reduce the amount of cheatgrass that will establish when the growth media is redistributed.

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APPENDIX A
2007 FIELD PHOTOS

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Photo 1: Transect 001 - Big sagebrush and black sagebrush with scattered juniper community.



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Photo 2: Transect 002 - Black sagebrush and bluebunch wheatgrass with scattered juniper community.



Photo 3: Transect 003 - Big sagebrush and black sagebrush-needlegrass with scattered juniper.

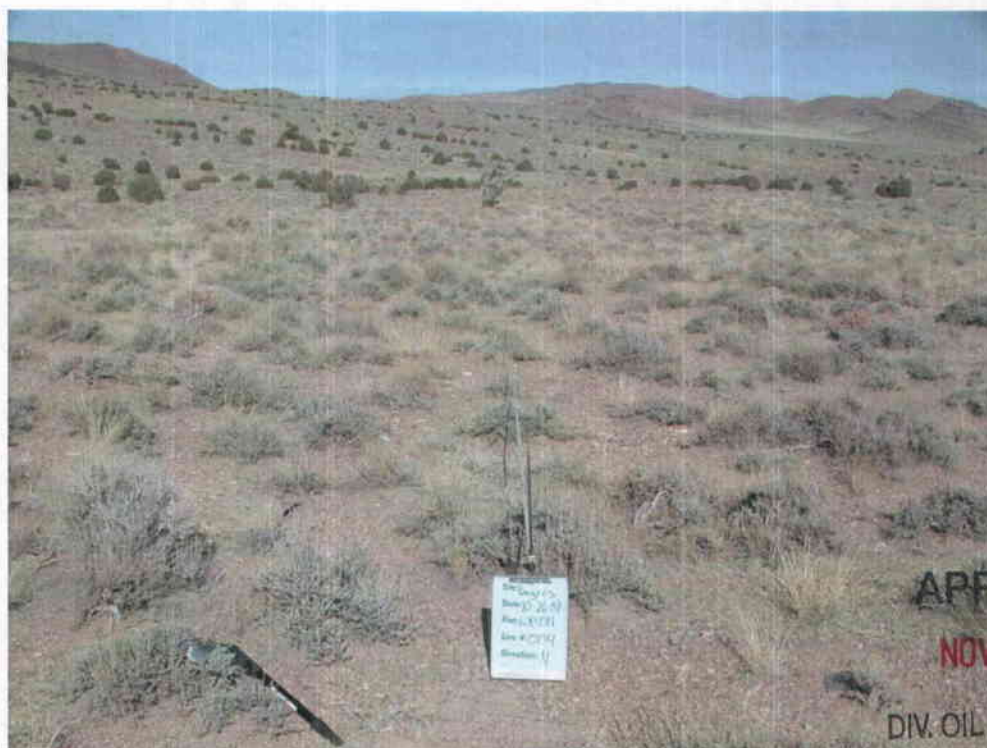


Photo 4: Transect 004 - Black sagebrush with scattered juniper community.

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Photo 5: South end of the Project area; disturbed area and the grassland or cheatgrass community.



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Photo 6: South-central Project Area; the grassland/cheatgrass, black sagebrush with scattered juniper, and juniper communities.



Photo 7: Central Project area; grassland/cheatgrass, black sagebrush/big sagebrush with scattered juniper, and juniper woodland communities.



Photo 8: North Project area; big sagebrush and black sagebrush with scattered juniper, black sage with scattered juniper, and juniper communities with patches of grassland/cheatgrass community.

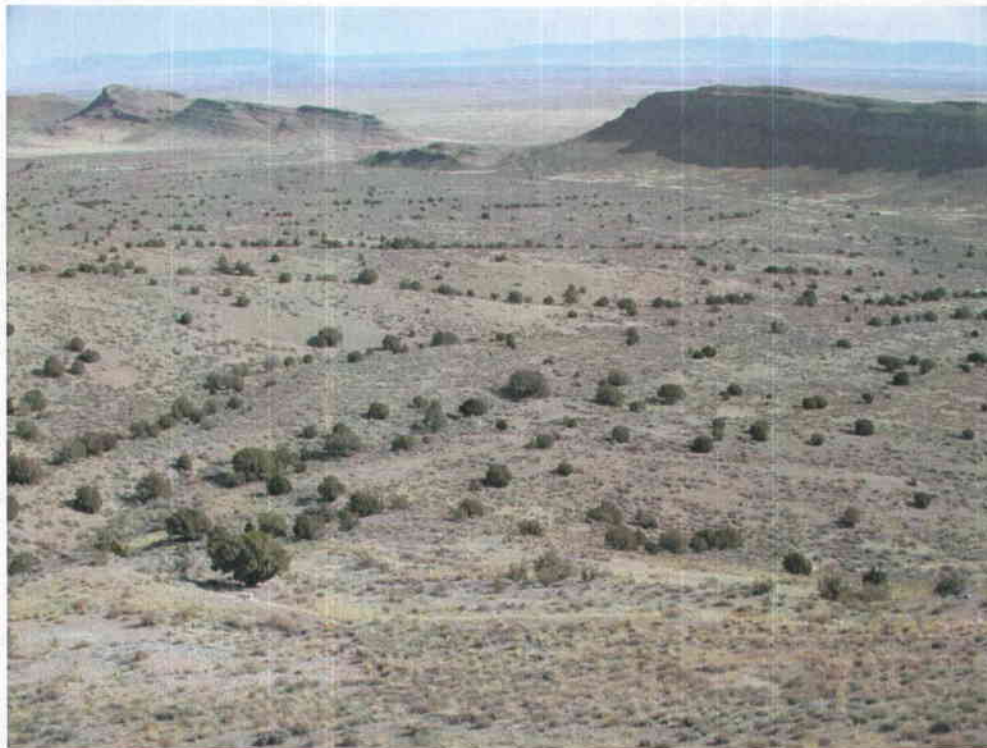


Photo 9: Big sagebrush and black sagebrush with scattered juniper community; potential ferruginous hawk nesting habitat in foreground, potential golden eagle nesting habitat in background (out of Project area).



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Photo 10: The juniper woodland community.

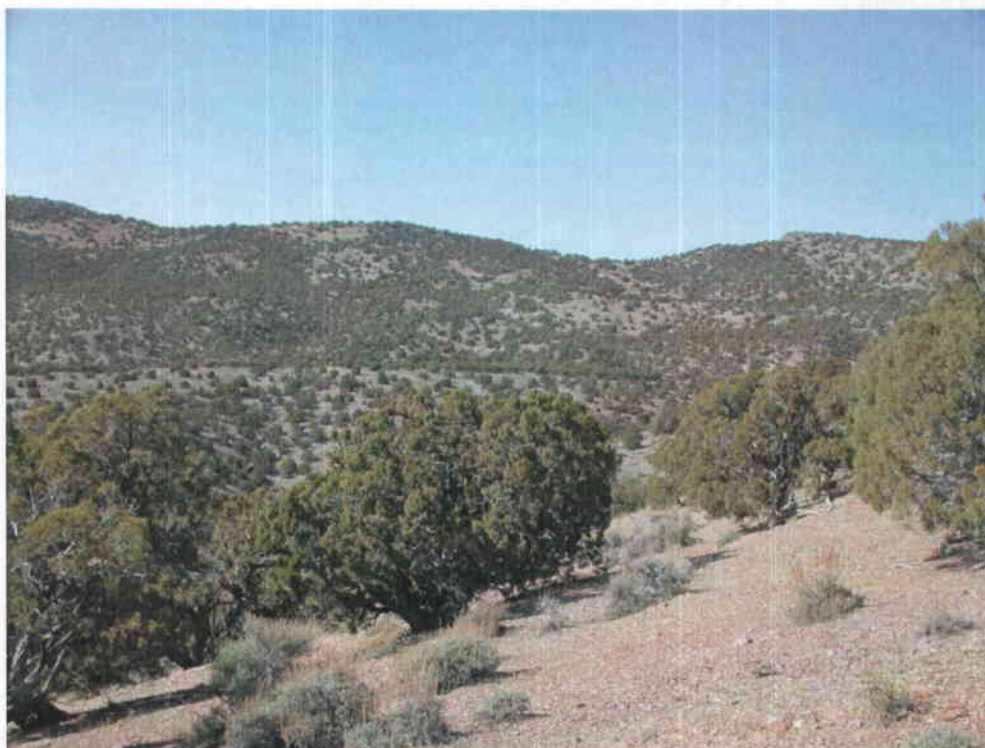


Photo 11: The juniper woodland community.



Photo 12: A wildlife guzzler located within the Project area.

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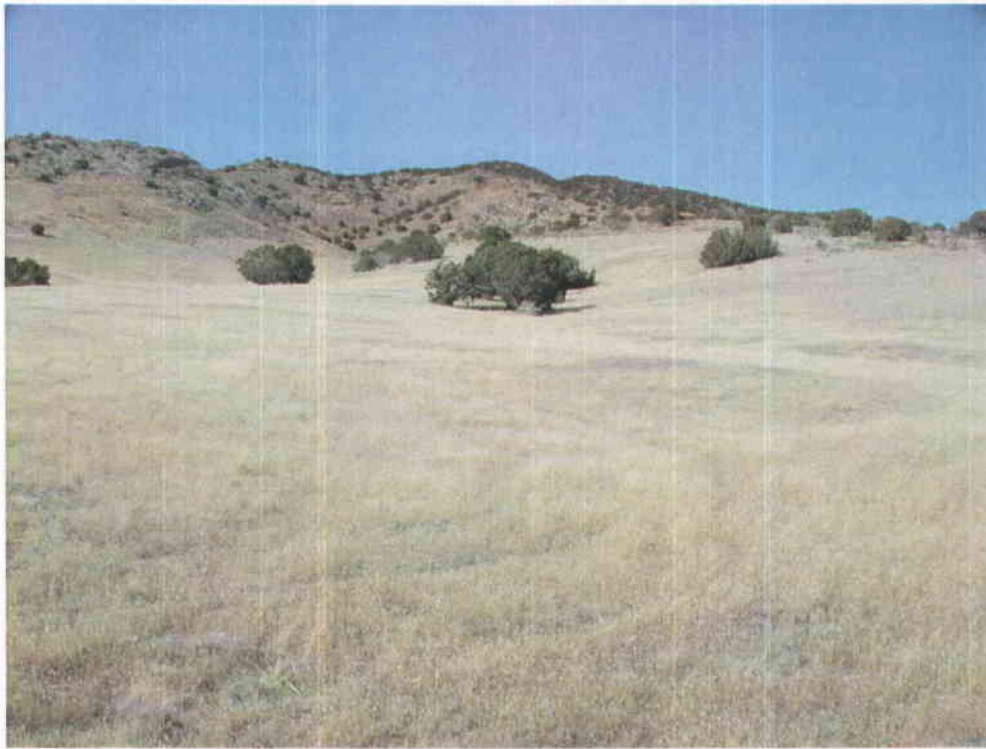


Photo 13: Grassland/cheatgrass community.

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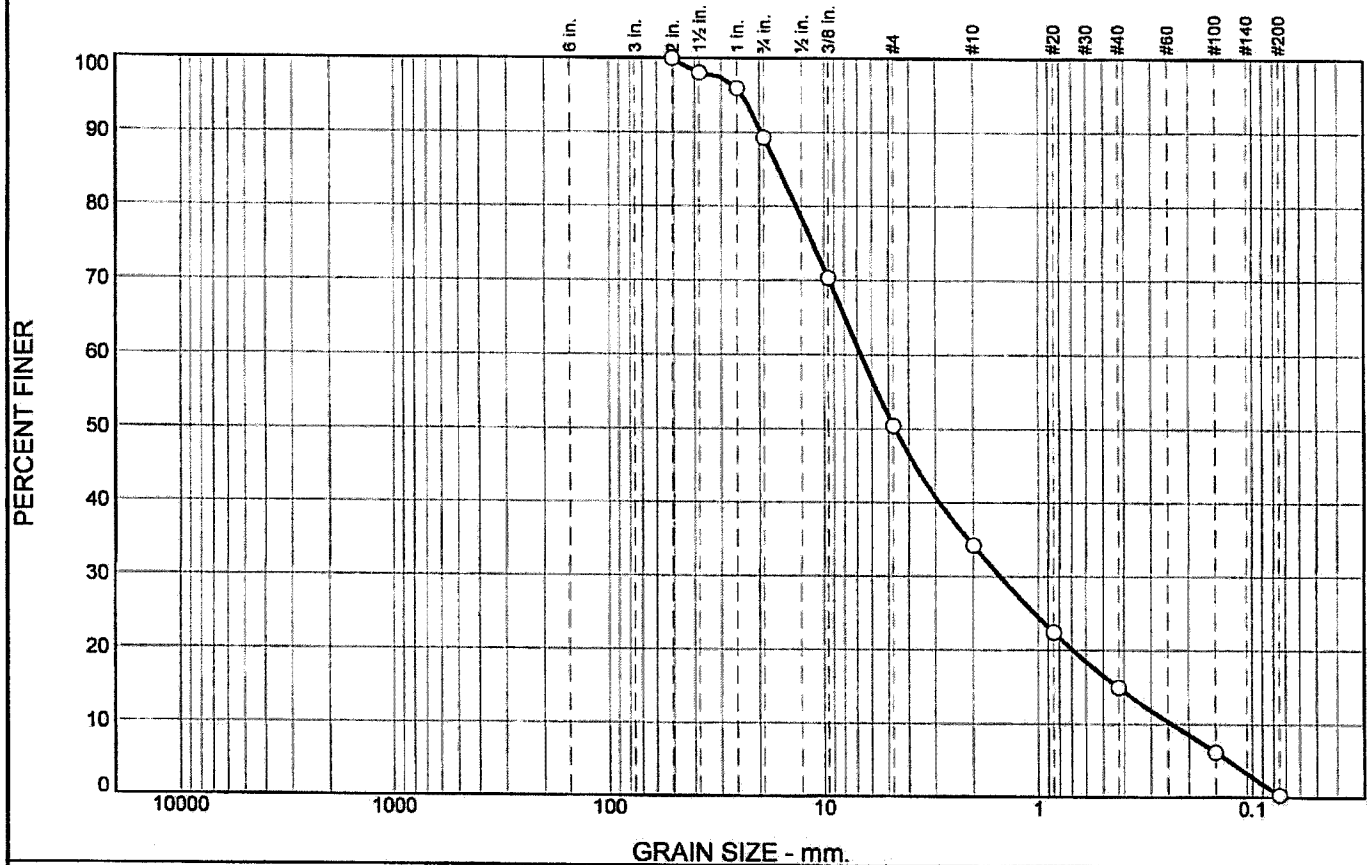
APPENDIX B
PARTICLE SIZE DISTRIBUTION REPORT

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	Silt
0	11	39	16	19	15	0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100		
1.5"	98		
1"	96		
3/4"	89		
3/8"	70		
#4	50		
#10	34		
#20	22		
#40	15		
#100	6		
#200	0.3		

* (no specification provided)

Sample Number: 004 Depth: Bulk Sample
Location: Soil Sample 004 WP005

Material Description

well-graded gravel with sand

Atterberg Limits

PL= NP

LL= NV

PI= NP

Coefficients

D₈₅= 16.2279

D₆₀= 6.7138

D₅₀= 4.6635

D₃₀= 1.5007

D₁₅= 0.4263

D₁₀= 0.2401

C_u= 27.97

C_c= 1.40

Classification

USCS= GW

AASHTO= A-1-a

Remarks

F.M.=4.92

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DIV. OIL GAS & MINING Date: 10-30-07



Client: SRK Consulting
Project: The Fingers

Project No: 138407

Figure



State of Utah

Department of
Environmental Quality

Richard W. Sprott
Executive Director

DIVISION OF AIR QUALITY
Cherly Heying
Director

JON M. HUNTSMAN, JR.
Governor

GARY HERBERT
Lieutenant Governor

DAQE-AN0103130026-08

January 24, 2008

Scott Mork
Graymont Western US Inc.
Cricket Mountain Plant
P.O. Box 669
Delta, Utah 84624

Dear Mr. Mork:

Re: Approval Order: Administrative Amendment to Approval Order DAQE-AN0103130022-07 for
Kiln Drive Fuel Type Designation; Millard County – CDS A; ATT; NSPS; NESHAPS; Title V
Major Project Code: N010313-0026

The Attached document is the Approval Order for the above-referenced project.

Future correspondence on this Approval Order should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. Please direct any technical questions you may have on this project to Mr. Jon Black. He may be reached at (801) 536-4047.

Sincerely,

M. Cheryl Heying, Executive Secretary
Utah Air Quality Board

cc: Central Utah Public Health Department

Mike Owens, EPA Region VIII

MCH:JB:kw

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STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

**APPROVAL ORDER: Administrative Amendment
to Approval Order DAQE-AN0103130022-07
for Kiln Drive Fuel Type Designation**

**Prepared By: Jon Black, Engineer
(801) 536-4047
Email: jlblack@utah.gov**

APPROVAL ORDER NUMBER

DAQE-AN0103130026-08

Date: January 24, 2008

Graymont Western US Inc.

**Source Contact
Scott Mork
(435) 864-3823**

**M. Cheryl Heying
Executive Secretary
Utah Air Quality Board**

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Abstract

Graymont Western US Inc. submitted a request for an Administrative Amendment to Approval Order (AO) DAQE-AN0103130022-07 for correct designation of fuel type for the kiln drive engines currently listed in Condition #9.T of the above stated AO.

Under both the New Source Review (NSR) and Title V programs, the Cricket Mountain Plant is a major stationary source of air emissions. This project will not result in an emissions increase. The Cricket Mountain Plant is located southwest of the city of Delta in Millard County, Utah. Millard County is an attainment area of the National Ambient Air Quality Standards (NAAQS) for all pollutants. The plant is located within 250 kilometers of several areas that are classified as Class I areas under the Prevention of Significant Deterioration (PSD) program for the protection of air quality.

New Source Performance Standards (NSPS) 40 CFR 60 Subparts A (General Provisions), Subpart Y (Standards of Performance for Coal Preparation Plants), Subpart HH (Standards of Performance for Lime Manufacturing Plants) and Subpart OOO (Standards of Performance for Nonmetallic Mineral Processing Plants) regulations apply to this source. National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 63 Subpart AAAAA (Lime Manufacturing Plants) regulations apply to this source. Maximum Achievable Control Technology (MACT) regulations do not apply to this source. Title V of the 1990 Clean Air Act applies to this source. There will not be an emissions increase associated with this Administrative Amendment for fuel type correction as the kiln drive engines were addressed in a previous AO document.

The emissions, in tons per year, will remain as follows: PM_{10} = 610.86, NO_x = 3884.17, SO_2 = 761.24, CO = 7817.80, VOC = 116.35, HAPs = 39.45.

The project has been evaluated and found to be consistent with the requirements of the Utah Administrative Code Rule 307 (UAC R307). A public comment period was held in accordance with UAC R307-401-7 and comments were received. All Comments were evaluated and addressed. This air quality Approval Order (AO) authorizes the project with the following conditions, and failure to comply with any of the conditions may constitute a violation of this approval order.

General Conditions:

1. This AO applies to the following company:

Site Office

Graymont Western US Inc.
Cricket Mountain Plant
P.O. Box 669
Delta, Utah 84624

Phone Number (435) 864-3823
Fax Number (435) 864-3431

Corporate Office Location

Graymont Western US Inc.
3950 South 700 East
Suite 301
Salt Lake City, Utah 84107

(801) 264-6876
(801) 264-6874

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The equipment listed in this AO shall be operated at the following location:

32 miles Southwest of Delta, Utah, Highway 257, Millard County

Universal Transverse Mercator (UTM) Coordinate System: UTM Datum NAD27
4,311.01 kilometers Northing, 343.10 kilometers Easting, Zone 12

2. All definitions, terms, abbreviations, and references used in this AO conform to those used in the Utah Administrative Code (UAC) Rule 307 (R307) and Title 40 of the Code of Federal Regulations (40 CFR). Unless noted otherwise, references cited in these AO conditions refer to those rules.
3. The limits set forth in this AO shall not be exceeded without prior approval in accordance with R307-401.
4. Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved in accordance with R307-401.
5. All records referenced in this AO or in applicable NSPS and/or NESHAP and/or MACT standards, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request. Records shall be kept for the following minimum periods:
 - A. Used oil consumption Five years
 - B. Emission inventories Five years from the due date of each emission statement or until the next inventory is due, whichever is longer.
 - C. Fugitive dust control Five years
 - D. All other records Five years
6. Graymont Western US Inc. (Graymont), shall operate the Cricket Mountain Plant with all associated equipment and shall conduct its operations of the Cricket Mountain plant in accordance with the terms and conditions of this AO, which was written pursuant to Graymont's Notice of Intent submitted to the Division of Air Quality (DAQ) on October 29, 2007.
7. Within 60 days after Kiln #5 achieves the maximum production rate at which the kiln will be operated at, but no later than 180 days after the initial startup of Kiln #5; Graymont shall only operate Kiln #1 with a baghouse for particulate emission control.
8. This AO shall replace the AO (DAQE-AN0103130022-07) dated August 14, 2007.

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9. The approved installations shall consist of the following equipment at the plant and quarry:

A. Lime Kiln #1, rated at 600 tons of lime per 24-hour period with a preheater and baghouse emissions control system rated at:

- 1) A/C ratio – To be determined¹
- 2) Exhaust gas flow rate - 54,000 scfm

The wet scrubber² emissions control system (Ducon UW-4, Size 138 or equivalent) rated at:

- 3) Exhaust gas flow rate - 32,000 scfm

B. Lime Kiln #2, rated at 600 tons of lime per 24-hour period with a preheater, cyclone and baghouse with the following parameters:

- 1) Air to cloth (A/C) ratio - 4.4:1
- 2) Exhaust gas flow rate - 48,000 scfm

C. Lime Kiln #3, rated at 840 tons of lime per 24-hour period with preheater, cyclone and baghouse with the following parameters:

- 1) A/C ratio - 4.6:1
- 2) Exhaust gas flow rate - 55,000 scfm

D. Lime Kiln #4, rated at 1266 tons of lime per 24-hour period with preheater, cyclone and baghouse with the following parameters:

- 1) A/C ratio -5:1
- 2) Exhaust gas flow rate - 100,000 scfm

E. Lime Kiln #5, rated at 1400 tons of lime per 24-hour period with preheater and baghouse with the following parameters:

- 1) A/C ratio – To be determined
- 2) Exhaust gas flow rate – 103,000 scfm

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1 - All air to cloth ratios shall be verified at the time of stack testing.

2 - Note: The wet scrubber will be in operation during the installation of Kiln #5 and will operate in accordance with Condition #7 of this AO.

- F. Coal Handling
 - 1) 4 - Vibratory Feeders
 - 2) Misc. Conveyors
- G. Coal Silo Baghouses
 - 1) D-91 & D-391 for kiln #1 and #3 respectively³
 - a. Exhaust gas flow rate - 1000 scfm
 - 2) D-94 for kiln #2
 - a. Exhaust gas flow rate - 1000 scfm
 - 3) D-491 for kiln #4
 - a. Exhaust gas flow rate - 1500 scfm
 - 4) D-591 for kiln #5
 - a. Exhaust gas flow rate - 1000 acfm
- H. Product Baghouses
 - 1) D-330 for Kiln #3
 - a. Exhaust gas flow rate - 11,000 scfm
 - 2) D-331 for Kiln #1, #2 and loadout
 - a. Exhaust gas flow rate - 32,000 scfm
 - 3) D-447 for Kiln #4
 - a. Exhaust gas flow rate - 18,300 scfm
 - 4) D-463 for Kiln #4, C472, C474, C464
 - a. Exhaust gas flow rate - 8,300 scfm
 - 5) D-341 for Silo T-341
 - a. Exhaust gas flow rate - 2,000 scfm

3 - All Equipment ID numbers are those used by Graymont Western U.S. Inc.

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- 6) D-530 (product handling baghouse #1 for new screen house)
 - a. Exhaust gas flow rate – 9,000 acfm
- 7) D-564 (product handling baghouse #2 for new screen house)
 - a. Exhaust gas flow rate – 9,000 acfm
- 8) D-547 (product handling baghouse #3 for new screen house)
 - a. Exhaust gas flow rate – 9,000 acfm

I. Lime Kiln Dust Silos with baghouses

- 1) D-83 (for Kilns #1, #2 and #3)(Baghouse D-489)
 - a. Exhaust gas flow rate – 5,000 scfm
- 2) D-486 (for Kiln #4)
 - a. Exhaust gas flow rate – 4,000 scfm
- 3) D-466 (for an additional silo)
 - a. Exhaust gas flow rate – 4,000 scfm
- 4) D-586 (for Kiln #5 dust silo)
 - a. Exhaust gas flow rate – 2,500 acfm
- 5) D-589 (for loadout of Kiln #5 dust silo)
 - a. Exhaust gas flow rate – 1,500 acfm

J. Product Loadout Baghouse

- 1) D-333 (rail load out)
 - a. Exhaust gas flow rate – 10,000 scfm

K. Limestone ore preparation (crushing and screening at both the quarry and the plant) with water spray or baghouses for dust control. In addition, the following:

- 1) D-10 (stone dressing screen for Kiln #1 & #2) baghouse
 - a. Exhaust gas flow rate - 8,000 scfm

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- 2) D-310 (stone dressing screen for Kiln #3) baghouse
 - a. Exhaust gas flow rate - 8,000 scfm
- 3) D-414 (stone dressing screen for Kiln #4) baghouse
 - a. Exhaust gas flow rate - 3,100 scfm
- 4) D-514 (stone dressing screen for Kiln #5) baghouse
 - a. Exhaust gas flow rate - 4,500 acfm
- 5) D-1 (Quarry Crusher & Screen) baghouse
 - a. Exhaust gas flow rate - 28,000 scfm
- 6) R-041 (Secondary Crusher)
 - a. Cone Crusher
 - b. Rated: 300 tons/hour
- 7) S-041 (Secondary Screen)
 - a. Rated: 600 ton/hour
 - b. 8' x 20'

L. Conveying systems

- 1) D-415 (Limestone dump to Kiln #4 preheater) baghouse
 - a. Exhaust gas flow rate - 600 scfm
- 2) D-403 (stone dump from conveyor 408 & 409 to reclaim pile) baghouse
 - a. Exhaust gas flow rate - 2,200 scfm
- 3) D-503 (dust collection for Kiln #5 limestone conveyor transfer points) baghouse
 - a. Exhaust flow rate - 2,000 acfm
- 4) C-045 (Fines Truck Loadout Conveyor)
 - a. Rated: 250 tons/hour

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- 5) C-305 (Medium and Small Stone Pile Conveyor)
 - a. Rated: 600 tons/hour
- M. Haul road (quarry to plant - six miles - and plant to highway) with dust suppression and water.
- N. Haul road (in quarry) with water spray for fugitive emissions and dust control.
- O. Dolomitic Lime handling System
 - 1) N470 (Recycle Bin)
 - 2) D479 Baghouse (Product transfer to S471, T470, T471, T472, T473, and T474. The 435 material handling system, which consists of 2 elevators, a vibratory conveyor, a number of belt conveyors, a mixing screw conveyor and a briquetter)
 - a. Exhaust gas flow rate – 6,220 scfm
- P. Limestone Grinding Plant
 - 1) D7122 Baghouse (Grinding Mill, Direct fire heater, Material separator)
 - a. Exhaust gas flow rate - 10,000 scfm
 - 2) D7133 Baghouse (Screen, 3 Bucket Elevators, 3 Storage Silos inlet)
 - a. Exhaust gas flow rate - 4,500 scfm
 - 3) D7141 Baghouse (Truck load-out, Rail load-out)
 - a. Exhaust gas flow rate - 3,500 scfm
 - 4) D7142 Baghouse (Rail load-out)
 - a. Exhaust gas flow rate – 4,000 scfm
 - 5) Misc. Conveyors
- Q. Sugar Stone System
 - 1) Misc. Conveyors, Screens, and Hopper
 - 2) Rail load-out
 - 3) 100 hp diesel generator

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R. Portable Crusher System

- 1) Feed Hopper
- 2) Primary Crusher
- 3) Secondary Crusher
- 4) Screen
- 5) Conveyors
- 6) 3 - Diesel engines - 740 hp total
Crusher System is rated at 690 tons/hour

S. Pressure Washer

T. Kiln Drive Engines

	<u>Kiln</u>	<u>Rating</u>	<u>Fuel Type</u>
1)	Kiln #1	52 HP	Gasoline or Diesel
2)	Kiln #2	45 HP	Gasoline or Diesel
3)	Kiln #3	55 HP	Gasoline or Diesel
4)	Kiln #4	65 HP	Gasoline or Diesel
5)	Kiln #5	156 HP	Gasoline or Diesel

Note: Rated capacities, flow rates and kiln drive engines listed in Condition 9 are for informational purposes and do not represent an AO limitation.

10. Graymont shall notify the Executive Secretary in writing when the installation of the equipment listed in Conditions #9.E, #9.G(4), #9.H(6)(7)(8), #9.I(4)(5), #9.K(4), #9.L(3), and #9.T has been completed and is operational, as an initial compliance inspection is required. To insure proper credit when notifying the Executive Secretary, send your correspondence to the Executive Secretary, attn: Compliance Section.

If the construction and/or installation has not been completed within eighteen months from the date of this AO, the Executive Secretary shall be notified in writing on the status of the construction and/or installation. At that time, the Executive Secretary shall require documentation of the continuous construction and/or installation of the operation and may revoke the AO in accordance with R307-401-18.

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Limitations and Tests Procedures

11. Emissions to the atmosphere at all times from the indicated emission points shall not exceed the following rates and concentrations:

Source: Kiln #1 (Baghouse Operation)

<u>Pollutant</u>	<u>lb/hr</u>	<u>lb/tsf</u> ⁴	<u>grains/dscf</u> (68°F, 29.92 in Hg)
TSP	0.12	0.020	
PM ₁₀	6.0	0.016	
SO ₂ ⁵	22.4		
NO _x	90.0		

Source: Kiln #1 (Scrubber Operation)⁶

<u>Pollutant</u>	<u>lb/hr</u>	<u>lb/tsf</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
TSP	19.75	0.60	0.072
PM ₁₀	15.9	0.058	
SO ₂ ⁷	22.4		

Source: Kiln #2

<u>Pollutant</u>	<u>lb/hr</u>	<u>lb/tsf</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
TSP	8.23	0.12	0.020
PM ₁₀	6.58	0.016	
SO ₂ ⁸	22.4		
NO _x	120.0		

Source: Kiln #3

<u>Pollutant</u>	<u>lb/hr</u>	<u>lb/tsf</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
TSP	9.43	0.12	0.020
PM ₁₀	7.54	0.016	

4 - lb/tsf is defined as (pounds per ton of stone fed) as required by 40 CFR 63 Subpart AAAAA.

5, 7, 8 - After the installation of an SO₂ CEMS, compliance with the SO₂ emission limit will be based on a 3-hour block average.

6 - Note: The wet scrubber will be in operation during the installation of Kiln #5 and will operate in accordance with Condition #7 of this AO.

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SO₂⁹27.2
 NO_x.....160.0

Source: Kiln #4

<u>Pollutant</u>	<u>lb/hr</u>	<u>lb/tsf</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
TSP	17.14	0.12	0.020
PM ₁₀	13.7		0.016
SO ₂ ¹⁰	38.4		
NO _x	200.0		

Source: Kiln #5

<u>Pollutant</u>	<u>lb/hr</u>	<u>lb/tsf</u>	<u>grains/dscf</u> (68°F, 29.92 in Hg)
TSP		0.10	0.020
PM ₁₀	11.7		0.016
SO ₂ ¹¹	59.0		
NO _x	210.0		
CO	233.0		

12. Stack testing to show compliance with the emission limitations stated in the above condition shall be performed as specified below:

A.		<u>Emissions Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Test Frequency</u>
		Kiln #1 Stack (Baghouse)	TSP	**	+
			PM ₁₀	**	+
			SO ₂	**	+
			NO _x	**	+
		Kiln #1 Stack (Scrubber)	TSP	***	+
			PM ₁₀	*	+
			SO ₂	*	+
B.		<u>Emissions Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Test Frequency</u>
		Kiln #2 Stack	TSP	***	+
			PM ₁₀	***	+

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9, 10, 11 - After the installation of an SO₂ CEMS, compliance with the SO₂ emission limit will be based on a 3-hour block average.

SO₂.....*+
NO_x.....*+

C.

<u>Emissions Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Test Frequency</u>
Kiln #3 Stack	TSP	***+
	PM ₁₀	***+
	SO ₂	*+
	NO _x	***+

D.

<u>Emissions Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Test Frequency</u>
Kiln #4 Stack	TSP	***+
	PM ₁₀	***+
	SO ₂	***+
	NO _x	***+

E.

<u>Emissions Point</u>	<u>Pollutant</u>	<u>Testing Status</u>	<u>Test Frequency</u>
Kiln #5 Stack	TSP	**+
	PM ₁₀	**+
	SO ₂	**+
	NO _x	**+
	CO	**+

F. Testing Status

- * No initial testing was required. However, testing is required every three years. The source shall be tested if directed by the Executive Secretary at any time.
- ** Initial compliance testing is required. The initial test date shall be performed as soon as possible and in no case later than 180 days after the start up of a new emission source, an existing source without an AO, or the granting of an AO to an existing emission source that has not had an initial compliance test performed. If an existing source is modified, a compliance test is required on the modified emission point that has an emission rate limit.
- *** Initial compliance testing was required.
- + Test every three years. The Executive Secretary may require testing at any time.

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G. Notification

The Executive Secretary shall be notified at least 60 days prior to conducting any required emission testing for sources subject to 40 CFR 63 Subpart AAAAA. All other sources shall notify the Executive Secretary at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted to DAQ when the testing notification is submitted to the Executive Secretary.

The source test protocol shall be approved by the Executive Secretary prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, stack to be tested, and procedures to be used. A pretest conference shall be held, if directed by the Executive Secretary.

H. Sample Location

The emission point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other methods as approved by the Executive Secretary. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location.

I. Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2 or other testing methods approved by the Executive Secretary.

J. Total Suspended Particulate (TSP)

40 CFR 60, Appendix A, Method 5

K. PM₁₀

For stacks in which no liquid drops are present, the following methods shall be used: 40 CFR 51, Appendix M, Methods 201, 201a, or other testing methods approved by the Executive Secretary. The back half condensibles shall also be tested using the method specified by the Executive Secretary. All particulate captured shall be considered PM₁₀.

For stacks in which liquid drops are present, methods to eliminate the liquid drops should be explored. If no reasonable method to eliminate the drops exists, then the following methods shall be used: 40 CFR 60, Appendix A, Method 5, 5a, 5d, or 5e as appropriate, or other testing methods approved by the Executive Secretary. The back half condensibles shall also be tested using the method specified by the Executive Secretary. The portion of the front half of the catch considered PM₁₀ shall be based on information in Appendix B of the fifth edition of the document, AP-42, or other data acceptable to the Executive Secretary.

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The back half condensibles shall not be used for compliance demonstration but shall be used for inventory purposes.

L. Sulfur Dioxide (SO₂)

40 CFR 60, Appendix A, Method 6, 6A, 6B, 6C, or other testing methods approved by the Executive Secretary.

M. Nitrogen Oxides (NO_x)

40 CFR 60, Appendix A, Method 7, 7A, 7B, 7C, 7D, 7E, or other testing methods approved by the Executive Secretary.

N. Carbon Monoxide (CO)

40 CFR 60, Appendix A, Method 10, or other testing methods approved by the Executive Secretary.

O. Calculations

To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors determined by the Executive Secretary, to give the results in the specified units of the emission limitation.

P. New Source Operation

For a new source/emission point, the production rate during all compliance testing shall be no less than 90% of the production rate listed in this AO. If the maximum AO allowable production rate has not been achieved at the time of the test, the following procedure shall be followed:

- 1) Testing shall be at no less than 90% of the production rate achieved to date.
- 2) If the test is passed, the new maximum allowable production rate shall be 110% of the tested achieved rate, but not more than the maximum allowable production rate. This new allowable maximum production rate shall remain in effect until successfully tested at a higher rate.
- 3) The owner/operator shall request a higher production rate when necessary. Testing at no less than 90% of the higher rate shall be conducted. A new maximum production rate (110% of the new rate) will then be allowed if the test is successful. This process may be repeated until the maximum AO production rate is achieved.

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Q. Existing Source Operation

For the existing kilns, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three (3) years.

13. Visible emissions from the following emission points shall not exceed the following values:

- A. Kilns #1, #2, #3, #4, and #5 15% opacity
- B. All ancillary silo and storage bin baghouses 10% opacity
- C. Product baghouses 10 % opacity
- D. All crushers 15% opacity
- E. All screens 10% opacity
- F. All conveyor transfer points 10% opacity
- G. All diesel engines 20% opacity
- H. Conveyor drop points 20% opacity
- I. Subpart OOO baghouses 7% opacity
- J. Subpart AAAAA PSH¹² operations stack emissions 7% opacity
- K. Subpart AAAAA PSH operations fugitive emissions 10% opacity
- L. All other points sources 20% opacity
- M. Fugitive dust (See Condition #21)

Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

For sources that are subject to NSPS, opacity shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9.

Visible emissions from haul road traffic shall be minimized in accordance with the fugitive dust control plan specified in Condition #17.

14. Graymont shall make at least one visual opacity survey each quarter for each kiln drive engine. The visual opacity survey shall be performed while the unit is operating by an individual trained on the observation procedures of 40 CFR 60, Appendix A, Method 9

12 - PSH is defined as Processed Stone Handling

The individual is not required to be a certified visual emissions observer (VEO). If visible emissions are observed from an emission unit, an opacity determination of that emission unit shall be performed by a certified observer within 24 hours of the initial survey. The opacity determination shall be performed in accordance with 40 CFR 60, Appendix A, Method 9. Graymont shall maintain a log of the visual opacity surveys, opacity determinations, and all data required by 40 CFR 60, Appendix A, Method 9.

15. The following combined lime production limits for the five (5) kilns, the Sugar Stone System, operation of the portable crushing system and truck hauling shall not be exceeded

A. For Kilns #1, #2, #3, #4 and #5 collectively:

- 1) 1,516,250 tons lime per rolling 12-month period
- 2) 4,706 tons lime per day

B. Sugar Stone System

- 1) 135,000 tons of sugar stone per rolling 12 month period
- 2) 1,000 hours of operation for the 100 hp generator per rolling 12 month period

C. Portable Crushing System

- 1) 750,000 tons of limestone per rolling 12 month period
- 2) 4,000 hours of operation per rolling 12 month period

D. Truck hauling of stone from the quarry to the plant

No more than 108 rounds trips per day (midnight to midnight) 24-hour period.

Compliance with the above 12-month production limitations shall be determined on a rolling 12-month total. Calculations for the 12-month production shall be completed within 25 calendar days from the end of the previous month. Records of production shall be kept for all periods when the plant is in operation. Production shall be determined by plant production records. Portable crusher system shall be determined by records of operation. The truck hauling shall be determined by records of operation. The records shall be kept on a daily basis.

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Roads and Fugitive Dust

16. Kiln #2's ID fan motor rate shall not exceed 1,800 rpm. The Fan Tachometer readings shall be observed and logged once per day.

17. Graymont shall abide by a fugitive dust control plan acceptable to the Executive Secretary for control of all dust sources associated with the Cricket Mountain Plant. Graymont shall abide by the most current fugitive dust control plan approved by the Executive Secretary.

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18. The main haul road and the sales road shall be chemically treated to stabilize the road surface at least three times per year. More frequent applications shall be applied, if necessary or required by the fugitive dust control plan or the Executive Secretary. Records of chemical treatment shall be kept for all periods when the plant is in operation similar to the records required in Condition #20 below.
19. The ½-mile portion of the main haul road, closest to the plant, shall be swept at least once every 30 days. Additional sweeping shall be required, if necessary, as determined by the responsible plant personnel or the Executive Secretary.
20. All unpaved roads and other unpaved operation areas that are used by mobile equipment shall be water sprayed and/or chemically treated to control fugitive dust. Treatment shall be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition, such that the opacity shall be minimized at all times the areas are in use or unless it is below freezing. Records of water treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:
 - A. Date
 - B. Number of treatments made, dilution ration, and quantity
 - C. Rainfall received, if any, and approximate amount
 - D. Time of day treatments were made
21. Additional haul road limitations shall include vehicle speed limitations as follows:
 - A. Twenty five (25) mph within the plant and in the vicinity of the crusher in the quarry area.
 - B. Forty (40) mph within 1.5 miles of either the plant or the quarry on the quarry road.
 - C. Fifty (50) mph outside of the 1.5 mile distance point of the plant or quarry on the quarry road.
 - D. Forty (40) mph between the plant and the paved highway.

The haul road speed shall be posted.
22. Graymont shall abide by all applicable requirements of R307-205 for Fugitive Emission and Fugitive Dust sources. The full text of R307-205, Emission Standards: Fugitive Emissions and Fugitive Dust is included as Appendix A. However, to be in compliance, this source must operate in accordance with the most current version of R307-205.

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Work Practices

23. Water sprays or chemical dust suppression sprays shall be installed at the following limestone handling points, if otherwise uncontrolled, to control fugitive emissions:

- A. Crushers
- B. Screens (emissions not controlled by a baghouse)
- C. Conveyor transfer points

The sprays shall operate whenever dry conditions warrant or as determined necessary by the Executive Secretary, such that the limitations in Condition #13 will not be exceeded, unless the ambient temperature is below freezing.

24. Graymont shall minimize the drop distance from the radial stackers to the stockpiles by stockpile building procedures of building to the top and side of the established part of the pile except for the initial pile building.
25. During start-up procedures, the baghouses for Kilns #1, #2, #3, #4, and #5 shall be allowed to be bypassed while burning start-up fuels (propane, diesel). Bypassing is allowed for 7 hours after coal firing is commenced. If bypassing a baghouse occurs more than 7 hours after coal firing is commenced, Graymont shall follow the notification requirements listed in R307-107-2, UAC. In addition if the baghouse is not in service within the 7 hour limit. Graymont shall:

- A. Record each occurrence in a log
- B. Calculate the excess emissions
- C. Show justification for failure to have the baghouse in service
- D. Submit an annual report of the occurrences of excess emissions and justification by January 31 of the following year
- E. Include the excess emissions in the emissions inventory

26. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded, and the records shall be maintained for a period of five (5) years. Maintenance records shall be made available to the Executive Secretary or Executive Secretary's representative upon request.

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Fuels

27. Graymont shall use coal as the primary fuel, except a combination of coal and petroleum coke (pet coke) may be used in Kilns #1 and #5, and propane and fuel oil as a startup fuel in all kilns. Prior to burning petroleum coke in Kilns #1 and #5 or coal with a sulfur content in excess of 1.0 lb/MMBTU in Kilns #1, #2, #3, #4, or #5, an SO₂ CEM must be installed, certified, and operating on that kiln in accordance with Condition 34.
28. Graymont shall use propane, diesel, and used oil in any combination in the direct fire heating system for the limestone grinding plant.
29. The sulfur content of any coal or any mixture of coals burned shall not exceed 1.0 pounds of sulfur per MMBTU heat input. Sulfur content shall be determined by Graymont Western or the coal supplier using ASTM Method D-3177-75, D-3174-03, D-3176-89, D-4239-94, D-55016-95 or an approved equivalent ASTM Method. If Graymont chooses supplier certification, the sulfur content shall be tested quarterly from a composite sample. If Graymont chooses to test the sulfur content of the coal, the composite sample shall be tested quarterly from a composite grab sample taken every 24 hours of operation. Records, or supplier furnished certifications, of this testing shall be kept on-site for a period of five (5) years and be provided to the Executive Secretary upon request.

After a SO₂ CEMS has been installed, calibrated, and is operating on a kiln, the coal that is burned in that kiln is exempt from the 1.0 pounds of sulfur per MMBTU heat input limitation of UAC R307-203-1(1).

30. The sulfur content of any fuel oil burned shall not exceed 0.85 pounds of sulfur per MMBTU heat input. Sulfur content shall be decided by ASTM Method D-3175-75, or an approved equivalent. The sulfur content shall be tested if directed by the Executive Secretary.
31. The air heating combustor burning used oil for energy recovery shall comply with the following:
- A. The concentration/parameters of contaminants in any used oil burned as fuel shall not exceed the following levels:

1)	Arsenic	5	ppm by weight
2)	Cadmium	2	ppm by weight
3)	Chromium	10	ppm by weight
4)	Lead.....	100	ppm by weight
5)	Total halogens	1,000	ppm by weight
6)	Sulfur.....	0.50	percent by weight

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- B. The flash point of all used oil to be burned as fuel shall not be less than 100 °F.
- C. Used oil that does not exceed any of the listed contaminants content may be burned. The owner/operator shall record the quantities of oil burned.
- D. Sources utilizing used oil as a fuel shall comply with the State Division of Solid and Hazardous Waste in accordance with R315-15, UAC.

Federal Limitations and Requirements

- 32. In addition to the requirements of this AO, all applicable provisions of 40 CFR 60, New Source Performance Standards (NSPS) Subpart A (General Provisions), Subpart Y (Standards of Performance for Coal Preparation Plants), Subpart HH (Standards of Performance for Lime Manufacturing Plants), Subpart OOO (Standards of Performance for Nonmetallic Mineral Processing Plants) and NESHAP 40 CFR 63 Subpart AAAAA (Lime Manufacturing Plants) apply to this installation.

Monitoring - General Process

- 33. Graymont shall install, calibrate, maintain, and continuously operate a continuous emissions monitoring system for the continuous measurement of opacity on kiln stacks¹³ #1, #2, #3, #4 and #5. The owner/operator shall record the output of the system for measuring the opacity of emissions. The monitoring system shall operate continuously in accordance with the DAQ Policy Document for Continuous Emission Monitoring Systems. The monitoring system shall comply with all applicable sections of R307-170, UAC and 40 CFR 60, Appendix B, Specification 1 - Opacity.

- 34. Graymont shall install, calibrate, maintain, and continuously operate a continuous emissions monitoring system (consisting of a SO₂ pollutant concentration monitor and a flow monitoring device) for the continuous measurement of SO₂ emissions on a kiln if that kiln burns pet coke or coal with a sulfur content in excess of 1.0 lb Sulfur/MMBtu.

The owner/operator shall record the output of the system for measuring SO₂ emissions. The monitoring system shall operate continuously in accordance with the DAQ Policy Document for Continuous Emissions Monitoring Systems. The monitoring system shall comply with all applicable sections of R307-170, UAC and 40 CFR 50 Appendix B, Performance Specifications 2 – SO₂ and NO_x Continuous Emission Monitoring Systems.

- 35. When a SO₂ CEMS has been installed calibrated, and is operating, the emission rate of SO₂ in pounds per hour measured by the SO₂ CEMS for each 3-hour block averaging period will be calculated by the following formula:

$$E_h = K \times C_{hp} \times Q_{hs} \times \left(\frac{100 - \%H_2O}{100} \right)$$

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13 - Kiln #1 shall have an opacity monitor installed and certified within 180 days of the baghouse installation.

Where: E_h = hourly SO₂ mass emission rate during unit operation, lb/hour
 $K = 1.66 \times 10^{-7}$ for SO₂, lb/scf/ppm
 C_{hp} = hourly average SO₂ concentration during unit operation, ppm (dry)
 Q_{hs} = hourly average volumetric flow rate during unit operation, scfh (wet)
 $\%H_2O$ = constant moisture value specific to each kiln, percent by volume

36. All continuous opacity monitoring devices as required in federal regulations and state rules shall be installed and operational prior to placing the affected source in operation. SO₂ CEMS shall be installed and operational on a kiln prior to that kiln burning coal with a sulfur content in excess of 1.0 lb Sulfur/MMBtu or burning pet coke.

Except for system breakdown, repairs, calibration checks, and zero and span adjustments required under 40 CFR 60.13(d), the owner/operator of an affected source shall continuously operate all required continuous monitoring devices and shall meet minimum frequency of operation requirements as outlined in 40 CFR 60.13(e) and R307-170, UAC.

37. The Executive Secretary shall consider the continuous monitoring requirements to be met when the following provisions are met:

A. Opacity Monitors and SO₂ CEMS

- 1) Shall operate in accordance with 40 CFR 60.13 and R307-170 UAC.

B. Excess Emission Requirements

- 1) At no time shall Graymont allow excess gaseous emissions to be emitted to the atmosphere, except as provided by the provisions of R307-107 (Unavoidable Breakdowns), UAC.
- 2) The Executive Secretary shall consider the source to be in compliance with SO₂ emission limits when the following provisions are met:
- a. Prior to installation of a SO₂ CEMS on a kiln, the average of three one-hour stack test results are less than the corresponding SO₂ emission limit for that kiln.
 - b. After installation of the SO₂ CEMS on a kiln, the 3-hour block average is less than the corresponding SO₂ emission limit for that kiln.
 - c. Three-hour block averages will begin on 12:01 am and end every 3 hours, thereafter.

C. Reporting

- 1) All sources required to install a continuous emission monitor shall submit a quarterly report in an electronic format provided by the **DWCOIL GAS & MINING**

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- 2) All exceedances are to be reported in the quarterly report with explanations (R307-170-8 Reason Categories, UAC) and corrective actions.

Records & Miscellaneous

38. Graymont shall comply with R307-150 Series. Inventories, Testing and Monitoring.
39. Graymont shall comply with R307-107. General Requirements: Unavoidable Breakdowns.

The Executive Secretary shall be notified in writing if the company is sold or changes its name.

This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including R307.

A copy of the rules, regulations and/or attachments addressed in this AO may be obtained by contacting the Division of Air Quality. The Utah Administrative Code R307 rules used by DAQ, the Notice of Intent (NOI) guide, and other air quality documents and forms may also be obtained on the Internet at the following web site:

<http://www.airquality.utah.gov/>

The annual emissions estimations below include point source, fugitive emissions, fugitive dust, road dust, and tail pipe emissions. These emissions are for the purpose of determining the applicability of Prevention of Significant Deterioration, non-attainment area, Maintenance area, and Title V source requirements of the R307. They are not to be used for determining compliance.

The Potential To Emit (PTE) emissions for this source (the entire plant) are currently calculated at the following values:

<u>Pollutant</u>	<u>Tons/yr</u>
Particulate.....	1114.23
PM ₁₀	610.86
SO ₂	761.24
NO _x	3884.17
CO	7817.80
VOC	116.35
HAPs	
HCL	17.29
Chlorine	6.545
Formaldehyde	5.039
Hydrogen Chloride.....	4.910
Hexane	1.015
Hydrogen Flouride.....	0.078
Chromium	0.607
Lead	0.602
Cobalt.....	0.577
M & P-Xylene.....	0.508

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Toluene	0.446
Benzene.....	0.416
Isomers of Hexane	0.268
Ethylbenzene.....	0.244
Manganese	0.273
Nickel.....	0.211
Selenium	0.201
O-Xylene.....	0.112
Arsenic	0.044
Cadmium.....	0.029
Mercury.....	0.032

Approved By:

M. Cheryl Heying, Executive Secretary
Utah Air Quality Board

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Appendix A

R307. Environmental Quality, Air Quality.

R307-205. Emission Standards: Fugitive Emissions and Fugitive Dust.

R307-205-1. Applicability.

- (1) Except where otherwise specified, R307-205 applies statewide.
- (2) The provisions of R307-205 shall not apply to any sources for which limitations for fugitive dust or fugitive emissions are assigned pursuant to R307-401, R307-305, or R307-307 nor shall they apply to agricultural or horticultural activities.
- (3) The following definitions apply throughout R307-205:
"Material" means sand, gravel, soil, minerals or other matter which may create fugitive dust.
"Road" means any public or private road.

R307-205-2. Fugitive Emissions.

Fugitive emissions from sources in areas outside Davis, Salt Lake and Utah Counties, Ogden City and any nonattainment area for PM10 and which were constructed before April 25, 1971, shall not exceed 40% opacity. Fugitive emissions from sources constructed after April 25, 1971, shall not exceed 20% opacity.

R307-205-3. Fugitive Dust.

- (1) Storage and Handling of Aggregate Materials. Any person owning, operating or maintaining a new or existing material storage, handling or hauling operation shall minimize fugitive dust from such an operation. Such control may include the use of enclosures, covers, stabilization or other equivalent methods or techniques as approved by the executive secretary.
- (2) Construction and Demolition Activities.
 - (a) Any person engaging in clearing or leveling of land greater than one-quarter acre in size, earthmoving, excavation, or movement of trucks or construction equipment over cleared land greater than one-quarter acre in size or access haul roads shall take steps to minimize fugitive dust from such activities. Such control may include watering and chemical stabilization of potential fugitive dust sources or other equivalent methods or techniques approved by the executive secretary.
 - (b) The owner or operator of any land area greater than one-quarter acre in size that has been cleared or excavated shall take measures to prevent fugitive particulate matter from becoming airborne. Such measures may include:
 - (i) planting vegetative cover,
 - (ii) providing synthetic cover,
 - (iii) watering,
 - (iv) chemical stabilization,
 - (v) wind breaks, or
 - (vi) other equivalent methods or techniques approved by the executive secretary.
 - (c) Any person engaging in demolition activities including razing homes, buildings, or other structures or removing paving material from roads or parking areas shall take steps to minimize fugitive dust from such activities. Such control may include watering and chemical stabilization or other equivalent methods or techniques approved by the executive secretary.

R307-205-4. Roads.

- (1) Any person planning to construct or operate a new unpaved road which is anticipated to have an average daily traffic volume of 150 vehicle trips per day or greater, averaged over a consecutive five day period, shall submit a notice of intent to construct or operate such a road to the executive secretary pursuant to R307-401. Such notice shall include proposed action to minimize fugitive dust emissions from the road.
- (2) The executive secretary may require persons owning, operating or maintaining any new or existing road, or having right-of-way easement or possessory right to use the same to supply traffic count information as determined necessary to ascertain whether or not control techniques are adequate or additional controls are necessary.
- (3) Any person who deposits materials which may create fugitive dust on a public or private paved road shall clean the road promptly.

R307-205-5. Mining Activities.

- (1) Fugitive dust, construction activities, and roadways associated with mining activities shall be regulated under the provisions of R307-205-5 and not by R307-205-3 and 4.
- (2) Any person who owns or operates a mining operation shall minimize fugitive dust as an integral part of site preparation, mining activities, and reclamation operations.
- (3) The fugitive dust control measures to be used may include:
 - (a) periodic watering of unpaved roads,
 - (b) chemical stabilization of unpaved roads,
 - (c) paving of roads,
 - (d) prompt removal of coal, rock minerals, soil, and other dust-forming debris from roads and frequent scraping and

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compaction of unpaved roads to stabilize the road surface,

(e) restricting the speed of vehicles in and around the mining operation,

(f) revegetating, mulching, or otherwise stabilizing the surface of all areas adjoining roads that are a source of fugitive dust,

(g) restricting the travel of vehicles on other than established roads,

(h) enclosing, covering, watering, or otherwise treating loaded haul trucks and railroad cars, to minimize loss of material to wind and spillage,

(i) substitution of conveyor systems for haul trucks and covering of conveyor systems when conveyed loads are subject to wind erosion,

(j) minimizing the area of disturbed land,

(k) prompt revegetation of regraded lands,

(l) planting of special windbreak vegetation at critical points in the permit area,

(m) control of dust from drilling, using water sprays, hoods, dust collectors or other controls approved by the executive secretary.

(n) restricting the areas to be blasted at any one time,

(o) reducing the period of time between initially disturbing the soil and revegetating or other surface stabilization,

(p) restricting fugitive dust at spoil and coal transfer and loading points,

(q) control of dust from storage piles through use of enclosures, covers, or stabilization and other equivalent methods or techniques as approved by the executive secretary, or

(r) other techniques as determined necessary by the executive secretary.

(4) Any person owning or operating an existing mining operation in an actual area of nonattainment for particulate or an existing mining operation outside an actual area of nonattainment from which fugitive dust impacts an actual area of nonattainment for particulate shall submit plans for control of fugitive dust from such operations to the executive secretary for approval no later than September 29, 1981, 180 days after the effective date of this regulation.

R307-205-6. Tailings Piles and Ponds.

(1) Fugitive dust, construction activities, and roadways associated with tailings piles and ponds are regulated under the provisions of R307-205-6 and not by R307-205-3 and 4.

(2) Any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities. Such controls may include:

(a) watering,

(b) chemical stabilization,

(c) synthetic covers,

(d) vegetative covers,

(e) wind breaks,

(f) minimizing the area of disturbed tailings,

(g) restricting the speed of vehicles in and around the tailings operation, or

(h) other equivalent methods or techniques which may be approvable by the executive secretary.

(3) Any person owning or operating an existing tailings operation in a nonattainment area for particulate or an existing mining operation outside an actual area of nonattainment from which fugitive dust impacts an actual area of nonattainment for particulate shall submit plans for control of fugitive dust from such operations to the executive secretary for approval no later than September 29, 1981, 180 days after the effective date of this regulation.

KEY: air pollution, fugitive emissions*, mining*, tailings*
1999

19-2-101

19-2-104

19-2-109

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FUGITIVE DUST CONTROL PLAN



GRAYMONT

**GRAYMONT WESTERN US INC.
CRICKET MOUNTAIN PLANT
DELTA, UTAH**

Revision Date: February 2, 2007

Prepared by:
Graymont Western US Inc.
3950 South 700 East, Suite 301
Salt Lake City, UT 84107

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APPENDICES

- Appendix A: Road Dust Control Log and Instructions
- Appendix B: Road Opacity Monitoring Form and Instructions
- Appendix C: Fugitive Dust Control Plan Annual Review Log

FIGURES

Figure 1: Cricket Mountain Plant Road Designations

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1.0 INTRODUCTION

The purpose of this plan is to describe dust control measures for minimizing fugitive dust which results from truck traffic along the Main Haul Road and the Sales Road at the Graymont Western US Inc. (Graymont) Cricket Mountain Plant. The Main Haul Road begins at the western edge of the Cricket Mountain Plant and ends at the Flat Iron Quarry, which is approximately 5.6 miles west of the plant. The Sales Road is located between the plant and Highway 257, which is located east of the plant.

This plan establishes the dust control measures that are technologically feasible and economically reasonable to minimize fugitive dust that is created by truck traffic along the Main Haul Road and Sales Road at the Cricket Mountain Plant. Implementation of these measures will ensure compliance with the applicable fugitive dust requirements in the Utah Administrative Rules (UAR) R307-205. Emission Standards: Fugitive Emissions and Fugitive Dust.

1.1 DUST PLAN IMPLEMENTATION

Overall, the fugitive dust from the Main Haul Road and the Sales Road represents a small fraction of the total emissions of particulate matter less than 10 microns (PM_{10}) from the Cricket Mountain Plant. The Cricket Mountain Plant is located in a remote desert area designated as attainment for all criteria pollutants. Adherence to this Fugitive Dust Control Plan will protect the public health and welfare as demonstrated by air dispersion modeling that was conducted as part of the Cricket Mountain Kiln #5 permitting project (see Cricket Mountain Plant, Notice of Intent, Kiln 5 Project, dated September 5, 2006).

Operating personnel and contractors at the Cricket Mountain Plant are responsible for implementing and documenting compliance with this plan.

1.2 WORK PRACTICES

Graymont recognizes that periods of unusual weather events such as strong winds or periods of freezing temperatures occur and some methods to control fugitive dust are less effective during these periods. Periods also occur when the established dust control measures may not be required to minimize dust because the potential for fugitive dust may be mitigated by events such as precipitation or moist conditions. However, under normal conditions, the dust control measures described in this plan will minimize fugitive dust and satisfy Graymont's requirements to comply with the applicable requirements in UAR R307-205.

1.3 SOURCE INFORMATION

Graymont Western US Inc.
Cricket Mountain Plant
32 Miles Southwest of Delta, Utah
P.O. Box 669
Delta, UT 84624

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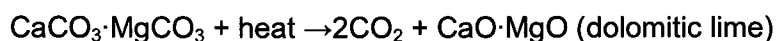
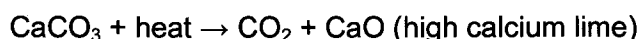
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1.4 PROCESS DESCRIPTION

The Cricket Mountain Plant produces lime and limestone products for sale to the customers of Graymont Western US Inc. The process begins at the quarry where limestone is blasted and then loaded onto trucks and transported to the crusher. The crusher is located within the quarry area. Once crushed and screened, the stone is conveyed to one of four storage piles. The various storage piles are the fines pile, small stone pile, medium stone pile, and large stone pile or Sugarstone pile. From the piles, the stone is either conveyed to a truck or transferred to a truck via a front-end loader.

The haul trucks transport the crushed limestone to the plant along the Main Haul Road. Once at the plant, the haul trucks bottom dump the stone in one of three hoppers. One hopper is for stone that will be transferred to Kilns 1 and 2, the second hopper is for Kiln 3, and the third hopper is for Kiln 4. A fourth hopper is proposed to be installed for Kiln 5. From the hopper feeds, the stone is conveyed to the storage piles via radial stackers. The stone is then conveyed from the storage piles to screens and then conveyed to the appropriate kiln preheater.

Each kiln is equipped with a preheater. The stone passes through the preheater and into the kiln. Limestone entering the kilns is subjected to heat and a tumbling action. This process chemically alters the limestone to lime. The reaction requires a temperature in excess of 2,200°F. The calcining of limestone in the kilns occurs by one of the following reactions:



The lime is cooled, screened, and crushed as needed to create the required product. The lime is stored in storage silos and then transferred from the storage silos to either trucks or railcars for transport to customers. These trucks travel along the Sales Road.

Kiln heat is supplied by burning pulverized coal. Coal is delivered by truck. The coal trucks travel along the Sales Road and unload the coal into one of two below-grade hoppers. The coal is conveyed from the hoppers to the coal silos. The coal is then conveyed from the bottom of the silos to the coal mills and then blown into the kilns. Each kiln has its own coal silo and coal mill. The coal feed rate to the kilns varies depending on kiln size and the size of the limestone being fed to the kilns. During a kiln startup, propane and/or diesel fuel is used as a startup fuel.

2.0 SOURCES OF ROADWAY FUGITIVE DUST

Activities that produce fugitive dust along the roads at the Cricket Mountain Plant include hauling crushed limestone to the plant on the Main Haul Road, hauling lime products from the plant on the Sales Road, and delivering coal to the plant. The sections of the Main Haul Road and the Sales Road are described in more detail in the following sections. Figure 1 displays the approximate locations of the various road sections.

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2.1 SALES ROAD

Type of Activities: Lime trucks hauling lime products from the plant and coal trucks delivering coal to the plant.

Description: The Sales Road has been repeatedly treated with dust suppressant for a number of years. The surface is hard and relatively flat. The road is fairly straight and traffic travels at a relatively uniform speed. All vehicles traveling on the Sales Road will adhere to the posted speed limit.

2.2 MAIN HAUL ROAD – FLAT IRON QUARRY TO INTERSECTION WITH DOLOMITE QUARRY

Type of Activities: Trucks hauling crushed limestone. Trucks consist of a tractor followed by one or more trailers. Rock haul trucks hauling broken limestone from the Dolomite Quarry to the crusher in the Flat Iron Quarry.

Description: This section of the Main Haul Road has been repeatedly treated with dust suppressant for a number of years. The surface is hard and relatively flat. Trucks do not travel a uniform speed over this section of the road since their speed varies as they approach and leave the Flat Iron and Dolomite quarries. Due to the changing speeds and exit from the quarries, this section of the road typically has more material (silt, sand, gravel, etc.) on it than the middle section of the Main Haul Road.

2.3 MAIN HAUL ROAD – 4.1-MILE SECTION EAST OF DOLOMITE QUARRY INTERSECTION

Type of Activities: Trucks hauling crushed limestone. Trucks consist of a tractor followed by one or more trailers.

Description: This section of the Main Haul Road has been repeatedly treated with dust suppressant for a number of years. The surface is hard and relatively flat. Trucks travel a uniform speed over this section of the road. The road is fairly straight in this section. This section of the road typically has little material (silt, sand, gravel, etc.) on it. The maximum speed allowed on this section of road is 50 miles per hour.

2.4 MAIN HAUL ROAD – ½-MILE SECTION WEST OF PLANT

Type of Activities: Trucks hauling crushed limestone. Trucks consist of a tractor followed by one or more trailers.

Description: This section of the Main Haul Road has been repeatedly treated with dust suppressant for a number of years. The surface is hard and relatively flat. Trucks do not travel a uniform speed over this section of the road since their speed varies as they approach and leave the plant area. Due to the changing speeds, this section of the road typically has more material (silt, sand, gravel, etc.) on it than the middle section of the Main Haul Road.

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INSERT FIGURE 1

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3.0 MONITORING

3.1 VISUAL DUST OBSERVATIONS

Visual dust observations shall be used to determine the dust control measures needed for the various sections of the roads identified in Section 2.0. Other indicators, such as weather conditions and level of truck traffic, may also be used to determine the most effective dust control measures.

Visual dust observations will be performed on an informal basis throughout the day by the water truck driver, haul truck drivers, Quarry Supervisor, and other plant personnel. At least once each day during normal business hours, the Quarry Supervisor or designated alternate will log the level of dust control implemented on the 'Road Dust Control Log'. The dust control levels are described in Section 4.0. The instructions for the log and a blank log are contained in Appendix A.

The observation can be made through the vehicle side-view mirror or from an observer not in the vehicle. Dust control measures that are to be implemented are outlined in Section 4.0.

3.2 ROAD DUST OPACITY MONITORING

Road dust opacity monitoring will be conducted to determine the overall effectiveness of the dust control measures and compliance with the applicable fugitive dust requirements in UAR R307-205.

Monitoring will be conducted on a weekly basis. The monitoring will be conducted at a different location each week. One of the weekly monitoring events each month will occur on the Sales Road.

The road dust opacity monitoring will be conducted in accordance with the following method that has been approved by USEPA. The form in Appendix B will be used to document the opacity monitoring. Additional information on the test method is available at:

<http://epa.gov/region9/air/phoenixpm/fip/method.html>.

- Step 1: Stand at least 16.5 feet from the source (travel lane) in order to provide a clear view of the emissions with the sun oriented in the 140-degree sector to the back. Following these requirements, make opacity observations so that the line of vision is approximately perpendicular to the dust plume and wind direction. If multiple plumes are involved, do not include more than one plume in the line of sight at one time.
- Step 2: Record the fugitive dust source location, source type, method of control used, observer's name, certification data, and a sketch of the observer's position relative to the fugitive dust source. Also record the time, estimated distance to the fugitive dust source location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), observer's position to the fugitive dust source, and color of the plume and type of background on the visible emission observation form both when opacity readings are initiated and completed.

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- Step 3: Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of vision. Make opacity observations approximately 1 meter above the surface from which the plume is generated. Note that the observation is to be made at only one visual point upon generation of a plume, as opposed to visually tracking the entire length of a dust plume as it is created along a surface (along the road). Make two observations per vehicle, beginning the first reading at zero seconds and the second reading at five seconds. The zero-second observation should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume but, instead, observe the plume briefly at zero seconds and then again at five seconds.
- Step 4: Record the opacity observations to the nearest 5% on an observational record sheet. Each momentary observation recorded represents the average opacity of emissions for a 5-second period. While it is not required by the test method, EPA recommends that the observer estimate the size of vehicles which generate dust plumes for which readings are taken (e.g. mid-size passenger car or heavy-duty truck) and the approximate speeds the vehicles are traveling when readings are taken.
- Step 5: Repeat Step 3 and Step 4 until you have recorded a total of 12 consecutive opacity readings. This will occur once six vehicles have driven on the source in your line of observation for which you are able to take proper readings. The 12 consecutive readings must be taken within the same period of observation but must not exceed 1 hour. Observations immediately preceding and following interrupted observations can be considered consecutive.
- Step 6: Average the 12 consecutive readings together.

The road dust opacity monitoring will be conducted by an USEPA Method 9 certified observer. Results from the opacity monitoring will be recorded and maintained onsite.

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4.0 ROAD DUST CONTROL ACTIVITIES

4.1 DUST CONTROL LEVELS

Multiple levels of fugitive dust control measures will be implemented as needed for the Sales Road and the different sections of the Main Haul Road. The first level, Level 0, describes when no dust control measures are required. Higher levels describe dust control measures that are progressively more stringent.

Monitoring indicators that advance the dust control measures to the different levels will be based on visual dust observations, weekly road dust opacity monitoring, weather conditions, and level of truck traffic. The water truck driver(s) will use the monitoring indicators and observations made by others to determine the proper dust control level and the dust control measures for the current conditions. The Quarry Supervisor shares the responsibility to verify that proper dust control measures are being implemented.

Level 1 is the baseline level. Roads will be watered at least once daily unless weather conditions make watering unnecessary (rain, damp conditions, etc.) or make driving conditions dangerous (freezing temperatures, snow, etc.). If weather conditions make watering unnecessary, the dust control level will decrease to Level 0. If freezing temperatures exist, the dust control level will either be Level 0 or Level 3 based on the results of the visual observations.

The following control levels shall be used in conjunction with the monitoring indicators:

- Level 0: No dust control measures are required due to rain, snow, little to no truck traffic, freezing temperatures, or other conditions where no fugitive dust is generated.
- Level 1: This level is the normal or typical dust control measure until other levels are triggered by a monitor indicator. The water truck shall be used at this level of dust control. The Sales Road and all sections of the Main Haul Road will be watered at least once daily. Typically, a single application of water re-activates the dust suppressant and the silt and larger particles adhere to the road surface.
- Level 2: This level of control consists of increased watering frequency for those locations where the monitor indicators show a high potential for fugitive dust generation. This level will most likely be needed during high wind events or on hot, dry days.
- Level 3: This level of control consists of the use of a street sweeper or vacuum truck to remove material (silt, sand, gravel, etc.) on the road surface in those locations where lower levels of dust control measures have not been effective. This level of dust control may also be required when freezing temperatures prohibit the use of the water truck due to the creation of unsafe driving conditions.

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Based on past experience, dust suppressant treatments plus the proper implementation of the three levels of control outlined above should be sufficient to minimize dust generation. Generally, the entire road is in good shape, but problems may arise in small sections due to dust blown from the desert and landing on the road, road is slightly inclined so the surface in this area degrades at a slight faster rate than other sections, formation of pot holes, etc. If the implementation of Level 3 controls does not control the dust in the problem section(s), one or more of the following actions will be taken:

- Apply another coat of dust suppressant to the problem section(s) of the road
- Reduce the speed of the haul trucks while passing through the problem section(s) of the road
- Perform road maintenance as needed in the problem section(s), such as repairing a pot hole or grading the surface

4.2 ROUTINE DUST CONTROL ACTIVITIES

The following dust control activities will be performed on routine basis:

- The Main Haul Road and the Sales Road will be treated with dust suppressant three times per year.
- Roads will be watered at least once per day and on an as-needed basis unless weather conditions make watering unnecessary (rain, damp conditions, etc.) or create dangerous driving conditions (freezing temperatures, snow, etc.).
- The ½-mile section of the Main Haul Road that is closest to the plant will be swept at least once per month and on an as-needed basis.
- All vehicles traveling on the Sales Road and Main Haul Road will adhere to the posted speed limits.

5.0 RECORDKEEPING

Records will be maintained to demonstrate that the Fugitive Dust Control Plan is implemented. These records will be located in the environmental files in Main Office Building at the Cricket Mountain Plant. Completed Road Dust Control Logs and Road Opacity Monitoring Sheets will be maintained. Blank copies of the Road Dust Control Log and Road Opacity Monitoring Form are located in Appendix A and B, respectively.

Records will be maintained on site for at least 5 years in accordance with the Cricket Mountain Plant's current Title V Operating Permit requirements and will be made available to inspectors at their request.

6.0 QUALITY ASSURANCE

Annually, unless otherwise needed, this plan and the Road Dust Control Logs will be reviewed by the Cricket Mountain Plant Manager and a Graymont Environmental Engineer. If the UDAQ determines that revisions to this plan are necessary, the plan will be revised and submitted to the UDAQ. The review log will be maintained in Appendix C.

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APPENDIX A

Road Dust Control Log and Instructions

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Road Dust Control Log Instructions

Graymont Western US Inc. - Cricket Mountain Plant

PURPOSE: Visual dust observations shall be used to determine the dust control measures needed for the Sales Road and the sections of the Main Haul Road. This log provides a record of the dust control measures implemented.

INSTRUCTIONS:

- 1) Once each normal business day, the Quarry Supervisor or designated alternate must record the level of dust control implemented on that day for each section of road on the Road Dust Control Log.
- 2) If a level 1, 2, or 3 was recorded, the actions taken must be indicated by placing an X in the corresponding box or describing the actions taken if they are not listed.

DUST CONTROL LEVELS:

- Level 0: No dust control measures needed due to rain, snow, little or no truck traffic, freezing temperatures, or other conditions where no fugitive dust is occurring.
- Level 1: Water truck used once per day.
- Level 2: Increased watering frequency is required (i.e., more than once per day).
- Level 3: Street sweeper or vacuum truck used.

ROAD SECTIONS:

- Sales Road: Road between plant and highway 257
- FIQ-DOQ: Main haul road between Flat Iron Quarry and Dolomite Quarry (west end)
- DOQ-P (W): 4.1-mile section from the Dolomite Quarry towards the Plant on the Main Haul Road (middle section)
- DOQ-P (E): ½-mile section of the Main Haul Road that is closest to the plant (east end)

RECORDKEEPING:

Store completed Road Dust Control Logs in the environmental files in the Main Office Building.

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Road Dust Control Log

Graymont Western US Inc.
Cricket Mountain Plant

DATE	INITIALS	ROAD SECTION	DUST CONTROL LEVEL	ACTIONS TAKEN			
				WATER ONCE PER DAY	HIGHER WATERING FREQUENCY	USED STREET SWEEPER	OTHER ACTION TAKEN – DESCRIBE ACTION(S)
		Sales Road					
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					
		Sales Road					
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					
		Sales Road					
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					
		Sales Road					
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					
		Sales Road					
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					
		Sales Road					APPROVED NOV 06 2008 DIV. OIL GAS & MINING
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					
		Sales Road					
		FIQ-DOQ					
		DOQ-P (W)					
		DOQ-P (E)					

APPENDIX B

Road Opacity Monitoring Form and Instructions

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Road Opacity Monitoring Instructions

Graymont Western US Inc. - Cricket Mountain Plant

PURPOSE: Road dust opacity monitoring will be conducted to determine the overall effectiveness of the dust control measures.

INSTRUCTIONS:

- 1) Conduct opacity monitoring one time per week. One of the weekly monitoring events each month must occur on the Sales Road. All other monitoring events will take place along the Main Haul Road.
- 2) The weekly monitoring events must be conducted at a different location each week. This will ensure that the dust control measures implemented at the different road sections are effective.
- 3) Conduct the opacity monitoring in accordance with the following method and record the information on the Road Opacity Monitoring Form.

OPACITY MONITORING PROCEDURE:

- 1) Stand at least 16.5 feet from the source (travel lane) in order to provide a clear view of the emissions with the sun oriented in the 140-degree sector to the back.
- 2) Make opacity observations so that the line of vision is approximately perpendicular to the dust plume and wind direction. If multiple plumes are involved, do not include more than one plume in the line of sight at one time.
- 3) Record the following information on the Road Opacity Monitoring Form:
 - a. Fugitive dust source location
 - b. Method of control used
 - c. Observer's name and certification data
 - d. A sketch of the observer's position relative to the fugitive dust source
 - e. Time, approximate wind direction, estimated wind speed
 - f. Description of the sky condition (presence and color of clouds)
 - g. Estimated distance to the fugitive dust source location
 - h. Color of the plume and type of background on the visible emission observation form both when opacity readings are initiated and completed.
- 4) Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of vision.

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- 5) Make opacity observations approximately 1 meter above the surface from which the plume is generated. Note that the observation is to be made at only one visual point upon generation of a plume, as opposed to visually tracking the entire length of a dust plume as it is created along a surface (along the road).
- 6) Make two observations per vehicle, beginning the first reading at zero seconds and the second reading at five seconds. The zero-second observation should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume but, instead, observe the plume briefly at zero seconds and then again at five seconds.
- 7) Record the opacity observations to the nearest 5% on Road Opacity Monitoring Form. Each momentary observation recorded represents the average opacity of emissions for a 5-second period.
- 8) Record the type of vehicles which generate the dust plumes for which readings are taken (e.g. mid-size passenger car or heavy-duty truck) and the approximate speeds the vehicles are traveling when readings are taken.
- 9) Repeat Steps 4 through 8 until you have recorded a total of 12 consecutive opacity readings. This will occur once six vehicles have driven on the source in your line of observation for which you are able to take proper readings. The 12 consecutive readings must be taken within the same period of observation but must not exceed 1 hour. Observations immediately preceding and following interrupted observations can be considered consecutive.
- 10) Average the 12 consecutive readings together.

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Road Opacity Monitoring Sheet

Graymont Western US Inc.

Cricket Mountain Plant

OBSERVER:		OBSERVATION DATE:		
OBSERVER'S SIGNATURE:		OBSERVATION START TIME:		
OBSERVER'S CERTIFICATION DATE:		OBSERVATION END TIME:		
SECTION OF ROAD OBSERVING: <input type="checkbox"/> SALES ROAD MAIN HAUL ROAD: <input type="checkbox"/> 1/2-MILE EAST END <input type="checkbox"/> MIDDLE 4.1-MILE SECTION <input type="checkbox"/> FIQ TO DOQ INTERSECTION (WEST END)				
FOR MAIN HAUL ROAD INDICATE DISTANCE FROM EASTERN CATTLE GUARD CROSSING: _____ MILES				
METHOD OF CONTROL LAST APPLIED: <input type="checkbox"/> DUST SUPPRESSANT <input type="checkbox"/> WATER <input type="checkbox"/> STREET CLEANING <input type="checkbox"/> OTHER: _____				
WEATHER CONDITIONS		VISIBLE EMISSION OBSERVATION		
ESTIMATED WIND SPEED: _____ MILES PER HOUR APPROXIMATE DIRECTION WIND IS BLOWING FROM: <div style="text-align: center; margin-top: 10px;">NW N NE W E SW S SE</div> SKY CONDITIONS (CIRCLE ONE): CLEAR OVERCAST CLOUDY: 20% 40% 60% 80%		COLOR OF THE PLUME: BEGINNING: _____ ENDING: _____ PLUME BACKGROUND (CIRCLE ONE): BEGINNING: CLEAR SKY CLOUDS VEGETATION ENDING: CLEAR SKY CLOUDS VEGETATION BACKGROUND COLOR: _____ DISTANCE FROM DUST SOURCE TO OBSERVER: _____ FEET		
OPACITY OBSERVATIONS				
	FIRST READING* (AT ZERO SECONDS)	SECOND READING* (AT FIVE SECONDS)	VEHICLE TYPE (SEMI-TRUCK, PICKUP TRUCK, ETC.)	APPROXIMATE VEHICLE SPEED (MPH)
VEHICLE 1				
VEHICLE 2				
VEHICLE 3				
VEHICLE 4				
VEHICLE 5				
VEHICLE 6				
AVERAGE OF THE 12 READINGS:			* EACH READING REPRESENTS THE AVERAGE OPACITY OF THE EMISSIONS FOR A 5-SECOND PERIOD * RECORD OPACITY OBSERVATIONS TO THE NEAREST 5%	
OBSERVER'S POSITION			OBSERVER'S COMMENTS	
SKETCH OBSERVER'S POSITION RELATIVE TO THE DUST SOURCE AND SUN POSITION. <div style="text-align: center; margin-top: 20px;"><p>(CIRCLE SUN POSITION)</p></div>			<div style="font-size: 1.2em; font-weight: bold; margin-bottom: 5px;">APPROVED</div> <div style="font-size: 1.1em; font-weight: bold; margin-bottom: 5px;">NOV 06 2008</div> <div style="font-size: 1.0em; font-weight: bold; margin-bottom: 5px;">DIV. OIL GAS & MINING</div>	

APPENDIX C

Fugitive Dust Control Plan Annual Review Log

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[illegible]

Appendix C

Surety Calculation

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MEMORANDUM

To:	Andrew Rupke, Graymont Western Inc.
Copy to:	Val Sawyer, SRK Consulting
From:	Renee Kockler, SRK Consulting
Date:	September 10, 2008
Project:	Cricket Mountain Mine – Fingers Amendment NOI (138409)
Subject:	Fingers Reclamation Surety Estimate

The reclamation surety estimate for the disturbance at the Fingers Project provides for third-party costs required to reclaim the disturbance as required by Utah Administrative Code R647-4-113. Costs have been provided for earthwork, revegetation, equipment removal, post-reclamation maintenance, equipment mobilization/demobilization, contingency, and escalation.

1.0 Labor, Equipment, and Materials Costs

Equipment operator and labor rates have been separated from equipment costs. Labor rates, including fringe, are based on Davis Bacon Wage Rates for Heavy Construction Projects in Millard County (UT20080011), February 8, 2008. Total equipment costs are based on Wheeler Machinery Company rental rates published for 2008 plus operating costs, which include diesel fuel at \$3.55 per gallon, lubrication, and wear items.

Materials costs are separated from equipment and labor costs. Seed costs are based on the approved broadcast seed mix for the Cricket Mountain Mine and are provided by a local seed company.

Seeding costs are based on broadcast seeding and include one laborer and rental of a manual broadcast seeder. Equipment operator costs are not associated with broadcast seeding because the manual broadcast seeder will be attached to the back of a dozer during the scarifying process.

2.0 Earthwork, Equipment Performance, and Production

Equipment selection is based on suitability and efficiency for each task. Each piece of equipment has standard productivity specifications under varying circumstances, such as grade, operator skill, and rolling resistance; productivity is estimated based on the Caterpillar Handbook, 35th Edition (2005). Equipment fleets and productivities used for reclamation surety calculations are provided in the attached spreadsheets.

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3.0 Equipment Mobilization and Demobilization

The *2008 Rental Rate Guide* and freight charge quotes from Wheeler Machinery Company (the CAT Rental Store in Salt Lake City, Utah) are utilized to determine mobilization and demobilization costs. For this mining project, the following equipment is utilized:

- One medium dozer (CAT D9);
- One small excavator (CAT 325);
- Four scrapers (CAT 631G);
- One motor grader (CAT 16H);
- One large wheel loader (CAT 992G);
- One 8,000-gallon water truck (CAT 621E); and
- One haul truck (CAT 777D).

A dozer and scrapers will be utilized to complete reclamation in a three- to four-month timeframe. The D9 dozer will be used for recontouring/regrading as well as ripping, scarifying, and assisting with growth media replacement. The 992G wheel loader and the 777D haul truck will be used for quarry berm construction, and the small excavator will be used for culvert removal. The scrapers, motor grader, and water truck will be utilized for topsoil replacement; the motor grader will also be utilized for minor regrading/recontouring.

4.0 Reclamation Costs for Each Category

Reclamation activities will be undertaken for mining located on private land. Each spreadsheet details the reclamation activities that will occur and the following sections include descriptions for the physical characteristics, equipment, and revegetation.

4.1 Overburden Piles (Spreadsheet A)

Overburden piles will be constructed at the overall final reclaimed slope. Final slopes will be blended into the surrounding natural topography, where practical. Contouring is estimated to be completed on approximately 39 acres of the overburden piles and the quarry backfill areas; the volume of overburden to be contoured is estimated at 62,920 cubic yards (cy).

The tops of the overburden piles will be covered with a layer of soil and broadcast-seeded. In some areas, the slopes of the overburden piles will be left at angle of repose in an overall configuration which is stable. Slopes of the piles that are at an angle that is safe for equipment to work will be covered with a layer of soil and seeded. The Conceptual Reclamation Map (Figure 7), shown in the Notice of Intent (NOI), shows which areas of the overburden piles will be covered with soil and seeded. The disturbance associated with the overburden/fines piles will be covered with soil, scarified, and seeded as shown in Spreadsheet A. Costs for ripping and seeding the quarry backfill areas are included in Spreadsheet C.

4.2 Yards and Stockpiles (Spreadsheet B)

Spreadsheet B provides reclamation costs for yards and stockpiles. The Fingers Quarry does not have any associated yard areas, so only reclamation costs for topsoil stockpiles are calculated.

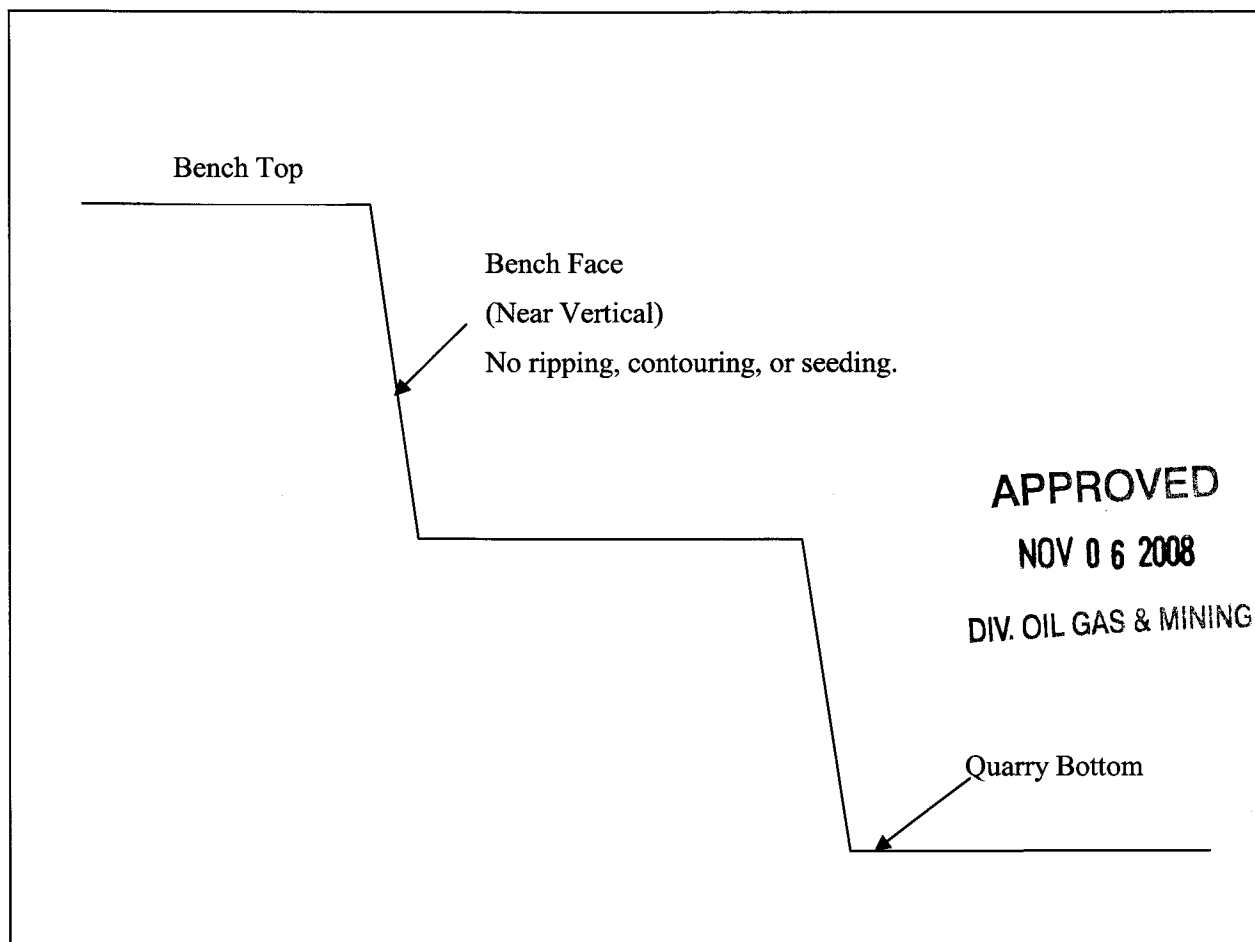
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Growth media will not be salvaged from the topsoil stockpile disturbance area during construction activities at the Fingers Quarry. Removal of growth media from the stockpile area for placement on contoured/regraded areas will be conducted in such a manner as to produce topography similar to the pre-mining topography and to leave sufficient topsoil to support revegetation without conducting additional earthworks. Therefore, costs for contouring topsoil stockpiles are not included in the surety calculation. Costs for scarifying and seeding the entire topsoil stockpile area are included in the surety calculation.

4.3 Quarries (Spreadsheet C)

Bench faces in the quarries will be nearly vertical; therefore, bench faces will not be ripped and seeded. Approximately ten percent of the quarry is estimated to be associated with bench faces; therefore, only 124.2 acres of the 138.0 acres of quarry will be ripped and seeded, which includes the quarry backfill areas. The following sketch illustrates an example of the bench faces that will not be reclaimed.



Sketch showing quarry bench faces that will not be reclaimed.

Where the underlying topography is level enough to allow equipment to safely operate, berms will be constructed around the quarry perimeter to prevent public access to the quarry. The estimated berm length is approximately 4,500 feet, which includes placement of an energy dissipater as shown in NOI Figure 7. The quarry berm cost estimate includes use of a CAT 992 wheel loader and a CAT 777D haul truck to

load and haul rock materials from the quarry to the perimeter. Average haul distances were estimated at 2,000 feet. To determine the volume of rock to be moved, berm construction was estimated at approximately three feet high at angle of repose with a crest width of one foot. The wheel loader will be used to shape the berms after the haul truck dumps the rock in the appropriate location.

4.4 Haul Roads (Spreadsheet D)

Roads without a defined post-mining land use will be reclaimed by recontouring/regrading with a CAT D9-class dozer and a motor grader or similar equipment. Regrade volume calculations are shown on Spreadsheet D1. Road surfaces will be covered with growth media, ripped, and broadcast-seeded.

4.5 Miscellaneous (Spreadsheet E)

Revegetation monitoring costs assume a range specialist will make a trip to the Project Area once per year for a period of three years to determine revegetation success. Costs associated with the range specialist site review and report writing are based upon an hourly rate of \$82 for 40 hours per year. Travel costs to the Project Area are estimated at eight hours of travel time for the 400 mile round trip from Salt Lake City, Utah with truck costs at \$20.24 per hour (\$17.88 per hour rental and \$2.88 per hour fuel/lube/wear).

Maintenance costs are based on revegetation of ten percent of acres vegetated during active reclamation. The amount of required revegetation is based on historical reclamation experience at the Cricket Mountain Mine. During active reclamation, 172.5 acres of disturbance will be seeded; therefore, an estimated 17.3 acres are expected to require reseeding.

Costs are provided for removal of up to two culverts. Culvert removal costs are based on the use of a CAT 325 excavator, one operator, and two laborers for four hours per culvert. The culvert size is assumed to be 36 inches in diameter. Costs for culvert removal include hauling the salvaged sections of culvert to the bone yard, which is a permitted facility under a separate permit area.

5.0 Summary

The reclamation cost summary spreadsheet provides a summary of reclamation by Project component. Individual costs are provided for equipment, labor, and materials. General site clean-up is estimated at one percent of the total direct costs. Indirect costs include contractor overhead and profit of ten percent and a contingency of ten percent. Escalation costs for five years at a rate of 3.8 percent per year are also included for a total surety estimate of \$872,967.00.

6.0 References

Caterpillar. (2005). *Caterpillar Performance Handbook*, Edition 35. Caterpillar, Inc., Peoria, Illinois.

RS Means (2007). *Means Heavy Construction Cost Data*, 21st Annual Edition.

Wheeler CAT. (2008). *Rental Rate Guide*.

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SRK Consulting
 1250 Lamoille Hwy., Suite 520
 Elko, Nevada 89801
 (775) 753-4151

**GRAYMONT WESTERN U.S., INC.
 CRICKET MOUNTAIN PROJECT - FINGERS QUARRY
 RECLAMATION COST SUMMARY**

SPREADSHEET/PROJECT COMPONENT	EQUIPMENT	LABOR	MATERIALS	TOTALS	PLAN VIEW ACRES
A Overburden Piles	\$148,366	\$23,160	\$6,748	\$178,274	68.9
B Stockpiles	\$2,577	\$432	\$646	\$3,656	6.6
C Quarries	\$265,426	\$41,319	\$12,163	\$318,909	138.0
D Haul/Access Roads	\$5,082	\$791	\$196	\$6,069	2.0
E Miscellaneous	\$800	\$9,631	\$395	\$10,826	NA
Subtotal	\$422,252	\$75,334	\$20,148	\$517,734	215.5
General Site Clean-Up (1% of total: RS Means, 2007, 017413.200040)				\$5,177	
Mobilization/Demobilization				\$80,800	
Total Direct Costs				\$603,712	
Contractor Overhead and Profit (10%)				\$60,371	
Contingency (10%)				\$60,371	
Total Direct and Indirect Costs				\$724,454	
Year 1 Escalation (3.8%)				\$27,529	
Year 2 Escalation (3.8%)				\$28,575	
Year 3 Escalation (3.8%)				\$29,661	
Year 4 Escalation (3.8%)				\$30,788	
Year 5 Escalation (3.8%)				\$31,958	
GRAND TOTAL				\$872,967	215.5
				\$/acre	\$4,051
Total Proposed Bond				\$872,967	

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Hourly Rates for Labor

SRK Consulting

Operator	Base Rate (1)	FICA (7.65% base)	SIIS (12.4%)	UIP (3% base rate)	Total (\$)
Power Equipment Operator	\$24.09	\$1.84	\$2.99	\$0.72	\$29.64
General Laborer	\$13.46	\$1.03	\$1.67	\$0.40	\$16.56
Foreman (2)	\$37.60	\$2.88	\$4.66	\$1.13	\$46.27

(1) Base rates include fringe and are from Davis Bacon Wage Rates for Heavy Construction Projects in Millard County (UT20080011), February 8, 2008.

(2) Supervisor rate is equal to highest power equipment operator rate in Davis Bacon Wage Rates for Heavy Construction Projects in Millard County (UT20080011), February 8, 2008.

EQUIPMENT RENTAL RATE TABLE			FUEL/LUBE/WEAR	
EQUIPMENT TYPE	TOTAL HOURLY RATE	NOTES	HOURLY RATE	HOURLY RATE
CAT D10T BULLDOZER	\$291.48	1	\$204.55	\$86.93
CAT D9R/T BULLDOZER	\$214.64	1	\$146.59	\$68.05
CAT 325CL EXCAVATOR	\$78.64	1	\$46.59	\$32.05
CAT 631G SCRAPER	\$207.40	1	\$113.07	\$94.33
CAT 16H MOTORGRADER	\$185.02	1	\$110.80	\$74.22
CAT 992G WHEEL LOADER	\$407.56	1	\$238.64	\$168.93
CAT 621E 8KGAL WATER WAGON	\$114.07	1	\$71.02	\$43.05
CAT 777 HAUL TRUCK	\$261.77	1	\$172.16	\$89.61
BROADCAST SEEDER	\$64.50	2	\$64.50	\$0.00

NOTES: Costs based on hours used

1. SOURCE: 2008 Wheeler CAT Rental Rates (4-week rental rates divided by 176 hours).

2. SOURCE: Slater Seeding July 2007, adjusted to July 2008.

SEED COST ESTIMATE				EQUIPMENT MOBILIZATION TABLE			
SEED	APPLICATION	COST	COST	EQUIPMENT TYPE	RATE	Max Number	Total \$
AMENDMENTS	RATE						
	(lb PLS/ac)	(\$/lb)	(\$/ac)				
Hycrest' crested wheat grass	1.44			CAT D9R/T BULLDOZER	\$1,500.00	1	\$1,500.00
Luna pubescent wheat grass	2.88			CAT 325L EXCAVATOR	\$900.00	1	\$900.00
Bozoisky Russian wildrye	2.88			CAT 631G SCRAPER	\$1,700.00	4	\$6,800.00
Koshia Prostrata	0.48			CAT 16H MOTORGRADER	\$1,200.00	1	\$1,200.00
Yellow sweetclover	1.44			CAT 992G WHEEL LOADER (2)	\$14,400.00	1	\$14,400.00
Shadscale - VNS	1.44			CAT 621E 8KGAL WATER WAGON	\$900.00	1	\$900.00
Fourwing Saltbrush - VNS	1.44			CAT 777 HAUL TRUCK (3)	\$14,700.00	1	\$14,700.00
Subtotal	12.00						
Total \$/acre			\$92.00				
Total \$/acre w/ 6.45% sales tax for Lehi, Utah County, Utah			\$97.93				
						Total	\$40,400.00
Seed cost estimate as per Granite Seed, August 12, 2008 quote. Individual seed costs were not provided.				(1) Includes disassembly to ship and re-assembly at site - 30 hours total as per Cashman Equipment (Reno) (2) Includes permits, two pilot cars, fall off load, and assembly and disassembly of the bucket and cab as per (3) Includes permits, two pilot cars, highway patrol escort, and assembly and disassembly of the rear duals as per Wheeler (2008). (4) Costs for mobilization only. Costs to de-mob will be the same.			

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EQUIPMENT FUEL, LUBE, AND WEAR CALCULATIONS	PM	UNDERCARRIAGE	GROUND ENGAGING	FUEL USE	FUEL COST	TOTAL HOURLY
EQUIPMENT TYPE	COST PER HOUR (1)	OR TIRES COST PER HOUR (2)	TOOLS CONSUMPTION COST PER HOUR (3)	RATE GAL/HR	PER GALLON \$3.55	EQUIPMENT OPERATING COST
CAT D10T BULLDOZER	\$7.26		\$15.77	18.00	\$63.90	\$86.93
CAT D9R/T BULLDOZER	\$6.17		\$11.29	14.25	\$50.59	\$68.05
CAT 325CL EXCAVATOR	\$4.22		\$4.40	6.60	\$23.43	\$32.05
CAT 631G SCRAPER	\$5.97	\$14.39	\$6.33	15.00	\$53.25	\$79.94
CAT 16H MOTORGRADER	\$4.78	\$13.65	\$15.52	7.50	\$26.63	\$60.57
CAT 992G WHEEL LOADER	\$10.16	\$23.56	\$25.54	23.00	\$81.65	\$140.91
CAT 621F 8KGAL WATER WAGON	\$5.24	\$4.97	N/A	9.25	\$32.84	\$38.08
CAT 777 HAUL TRUCK	\$9.87	\$16.03	\$3.36	17.00	\$60.35	\$89.61
NOTES: Costs based on hours used 1. PM Source: July 2008 Cashman Equipment Rental Rate, Elko, NV. 2. Undercarriage Source: D & D Tire, Inc. 7/3/08. 3. Ground Engaging Tools Consumption Source: CAT Historical Data. 4. Fuel Use Source: Caterpillar Handbook, Edition 35, Ch. 20; or estimated average for smaller vehicles.						

EQUIPMENT FUEL, LUBE, AND WEAR CALCULATIONS	# OF TIRES PER UNIT	COST PER TIRE	TIRE COST PER UNIT	TIRE LIFE (HOURS)	HOURLY TIRE COST PER UNIT
EQUIPMENT TYPE					
CAT D10T BULLDOZER	N/A				
CAT D9R/T BULLDOZER	N/A				
CAT 325CL EXCAVATOR	N/A				
CAT 631G SCRAPER	4	\$14,389.00	\$57,556.00	4,000	\$14.39
CAT 16H MOTORGRADER	6	\$7,961.00	\$47,766.00	3,500	\$13.65
CAT 992G WHEEL LOADER	4	\$31,519.00	\$126,076.00	4,500	\$28.02
CAT 621F 8KGAL WATER WAGON	4	\$9,947.00	\$39,788.00	8,000	\$4.97
CAT 777 HAUL TRUCK					
NOTES: Costs based on hours used 1. Unit Cost Basis: Cost per Set. 2. Cost Basis: Total cost for all required tires. 3. Tire Cost Source: D & D Tire, Inc. 6/8/07 4. Tire Wear Source: Caterpillar Handbook, Edition 35; Ch. 20					

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CRICKET MOUNTAIN PROJECT - FINGERS QUARRY

Revised:

10/27/2008

EARTHWORK / RECONTOURING
I. CATERPILLAR D9R BULLDOZER - UNIVERSAL BLADE PUSH CAT
SRK Consulting

PUSH CAT				
Production Rate				
(a) Material Density (lb/cy)		2600		
(a) Average Dozing Distance (ft)		50		
(e) Maximum Production for dozing distance (cy/hr)		2200		
Correction Factors				
(b) Operator	Average	0.75		
(b) Material	Average	1		
(b) Job Efficiency	50 min/hr	0.83		
(c) Weight Correction		0.884615385		
(b) Grade Correction	0 : 1	1		
(d) Total Correction Factor		0.55		
Corrected production (cy/hr)		1211		
Cost Rates				
Bulldozing		\$214.64		
Operator		\$29.64		
Total Equipment		\$244.28		

(a) Assumed 96 lbs/cu ft

(b) Acquired from the Caterpillar Performance Handbook, 35th Edition

(c) Determined using the Caterpillar Performance Handbook assuming a standard density of 2300 lb/cy : (2300 lb/cy) / Actual Density = Weight Correction Factor

(d) Total Correction Factor = Product (all correction factors)

(e) D9R will be used as a push cat and is reliant on the scrapers for production

EARTHWORK / RECONTOURING

Revised:

10/27/2008

II. CATERPILLAR D9R BULLDOZER - UNIVERSAL BLADE & MULTI-SHANK

	FLAT TERRAIN	SLOPED TERRAIN +3 : 1	RIPPING	
Production Rate				
(a) Material Density (lb/cy)		2600	2600	Ripper Width (ft) 7
(a) Average Dozing Distance (ft)		100	150	Effective Ripping Width (ft) 11.54
(b) Maximum Production for dozing distance (cy/hr)		1300	950	Operating Speed (mph) 1
Correction Factors				
(b) Operator	Average	0.75	0.75	Travel Length (ft/ac) 3775
(b) Material	average	1 loose	1.2	Two passes required 0.5
(b) Job Efficiency	50 min/hr	0.83	0.83	Production rate (ac/hr) 0.70
(c) Weight Correction		0.885	0.885	
(b) Grade Correction	0 : 1	1 : 3 : 1	1.66	
(d) Total Correction Factor		0.55	1.10	
Corrected production (cy/hr)		716	1042	
Cost Rates				
Bulldozing		\$214.64	\$214.64	\$214.64
Operator		\$29.64	\$29.64	\$29.64
Total Equipment		\$244.28	\$244.28	\$244.28

(a) Assumed 96 lbs/cu ft

(b) Acquired from the Caterpillar Performance Handbook, 35th Edition

(c) Determined using the Caterpillar Performance Handbook assuming a standard density of 2300 lb/cy : ((2300 lb/cy) / Actual Density) = Weight Correction Factor

(d) Total Correction Factor = Product (all correction factors)

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III. CATERPILLAR D10T BULLDOZER - UNIVERSAL BLADE & MULTI-SHANK

		FLAT TERRAIN	SLOPED TERRAIN +3 : 1	RIPPING
Production Rate				
(a) Material Density (lb/cy)		2600	2600	Ripper Width (ft) 7
(a) Average Dozing Distance (ft)		100	150	Effective Ripping Width (ft) 13
(b) Maximum Production for dozing distance (cy/hr)		1800	1300	Operating Speed (mph) 1
Correction Factors				
(b) Operator	Average	0.75	0.75	Travel Length (ft/ac) 3350
(b) Material	compacted alluvium	1 loose	1.2	Two passes required 0.5
(b) Job Efficiency	50 min/hr	0.83	0.83	Production rate (ac/hr) 0.79
(c) Weight Correction		0.884615385	0.884615385	
(b) Grade Correction	FLAT	1 3 : 1	1.66	
(d) Total Correction Factor		0.55	1.10	
Corrected production (cy/hr)		991	1426	
Cost Rates				
Bulldozing		\$291.48	\$291.48	\$291.48
Operator		\$29.64	\$29.64	\$29.64
Total Equipment		\$321.12	\$321.12	\$321.12

(a) Assumed 96 lbs/cu ft.

(b) Acquired from the Caterpillar Performance Handbook, 35th Edition

(c) Determined using the Caterpillar Performance Handbook assuming a standard density of 2300 lb/cy : ((2300 lb/cy)/ Actual Density) = Weight Correction Factor

(d) Total Correction Factor = Product (all correction factors)

EARTHWORK / RECONTOURING - 631G SCRAPER

IV. CATERPILLAR 631G SCRAPER

Growth Media Placement				
Production Rate				
(b) Capacity (cu. yd.)		31		
(a) Average Haul Distance (ft)		2500		
Cycle Time				
(b) Loading Time (min)		0.5		
(b) Spreading Time (min)		0.7		
(b) Loaded Haul Time (min)	8% Grade + 2% RR	3.9		
(b) Empty Haul Time (min)	-8% Grade + 2% RR	1.5		
Total time (min)		6.6		
Cycles per Hour	(min/hr)/(min/cycle)	9.09		
Production Rate (cy/hr)	Capacity*(Cyc/hr)	282		
Correction Factors				
(b) Operator	Average	0.75		
(b) Load Factor	Earth - Dry, Packed	0.9		
(b) Job Efficiency	50 min/hr	0.83		
(c) Total Correction Factor		0.56		
Corrected production rate (cy/hr)		159		
Cost Rates				
Scraper		\$207.40		
Operator		\$29.64		
Total Equipment		\$237.04		

(a) Internal estimation based on known spoil and growth media stockpile locations

(b) Acquired from the Caterpillar Performance Handbook, 35th Edition

(c) Total Correction Factor = Product (all correction factors)

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EARTHWORK / RECONTOURING
V. CATERPILLAR 16 - H GRADER

Revised:

10/27/2008

		SCARIFYING	BLADING
Production Rate			
Blade/Scarifying Width (ft)		16	16
Eff. Blade/Scarifying Width (ft)		9.75	16
Operating Speed (mph)		1.5	2.5
Travel Length (ft/ac)	(sf/ac)/eff. scar. width	4468	2722.5
Production Rate (acre/hr)	(speed*dist)/trav. lgth	1.82	3.03
Correction Factors			
(a) Operator	Average	0.75	0.75
(a) Job Efficiency	50 min/hr	0.83	0.83
(b) Total Correction Factor		0.62	0.62
Corrected Production Rate (ac/hr)		1.13	1.88
Cost Rates			
Grader		\$185.02	\$185.02
Operator		\$29.64	\$29.64
Total Equipment Cost		\$214.66	\$214.66

(a) Acquired from the Caterpillar Performance Handbook, 35th Edition

(b) Total Correction Factor = Product (all correction factors)

EARTHWORK / RECONTOURING
VI. CATERPILLAR 325CL EXCAVATOR

Revised:

27-Oct-08

		DEMOLITION	REGRAIDING
Production Rate			
(b) Capacity (lcy)			2.22 LCY
Fill Factor			0.9
Average Bucket Fill			2.00
Average Production (Cat Handbook for 1.998 LCY bucket)			480 LCY/hr
Job Efficiency			0.83
Production Factor			0.75
Average Production			299 LCY/hr
Cycles per Hour			
Cost Rates			
Excavator (\$/hr)			\$78.64
Operator (\$/hr)			\$29.64
Total Operating Cost (\$/hr)			\$108.28

(b) Acquired from the Caterpillar Performance Handbook, 35th Edition

(c) Estimations based on actual experience

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VII. REVEGETATION / STABILIZATION

Revised:

10/27/2008

BROADCAST SEEDING			
Production Rate			
		Manual Broadcast Seeder (a)	
Effective Seeding Width (ft)			15
Operating Speed (mph)			0.75
Travel Length (ft/ac)			2904
Production Rate (ac/hr)			0.7
Seed Equipment Rate (\$/acre)			\$64.50
Amendment Equipment Rate			\$0.00
Seed and Amendment Equipment Rate			\$16.56
Labor			
Seed Mixture (\$/ac)			\$97.93
Amendments (\$/acre)			

(a) Attach a manual broadcast seeder to the back of a dozer during the scarifying process; therefore, no additional equipment costs for manual broadcast seeding.

VIII. EARTHWORK / RECONTOURING EQUIPMENT COMBINATIONS

Revised:

27-Oct-08

VIII.			
Contour/Regrade Combinations			
Equipment	Total Productivity	Total Cost Equipment/Hour	Total Cost Labor/Hour
1 D10R-3 each; D9R-1	5320	\$1,089.06	\$118.57
2 1-D9R; 1-16H Grader (all production from dozer)	716	\$399.65	\$59.29
3 1-D9R dumps 150 ft push	1042	\$214.64	\$29.64
Growth Media Placement / Fill Combinations			
1 631 Scraper-4 each; 16H Motor Grader; 8000-gallon Water Wagon; D9R Dozer-1 each	636	\$1,343.31	\$207.50
Rip			
1 D9R Dozer- acres per hour	0.70	\$214.64	\$29.64
Scarify Combinations			
1 1-D9R	0.70	\$214.64	\$29.64
	ac/hr average		
Fill Combinations			
1 631 Scraper-4 each; 16H Motor Grader; 8000-gallon Water Wagon; D9R Dozer-1 each	636	\$1,343.31	\$207.50

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QUARRY BERMS

Revised:

27-Oct-08

IX.

	CAT 992	CAT 777
Load Production Rate		
(a) Material Density (lb/cy)	2600	2600
(b) Capacity (cy)	15	76.9
Average Haul Distance (ft)	20	2,000
Average Haul Gradient (%)	0	8 uphill loaded
Loaded Haul Speed (mph)		18
Empty Haul Speed (mph)		35
Cycle Time		
Average Load, Dump, Maneuver Time (min)	0.7 Per bucket	
Buckets per Loaded Truck	5	
Truck Maneuver Time (min)		0.7
Excavation Time (min)	3.5	
Loaded Haul Time (min)		1.3
Dump Time (min)		1.1
Empty Haul Time (min)		0.6
Total Cycle Time per Truck (min)		7.2
(b) Cycles per Hour	8.333333333	
Production per Hour (cy)	625	
Average Bucket Fill Factor	0.9	
50 min/hour	0.83	
Corrected Production (cy/hr)	469	
Cost Rates		
Equipment (\$/hr)	\$407.56	\$261.77
Operator (\$/hr)	\$29.64	\$29.64
Total Operating Cost for 992 with 777 (\$/hr)	\$728.62	

(a) Assumed 96 lbs/cu ft.

(b) Acquired from the Caterpillar Performance Handbook, 35th Edition

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CRICKET MOUNTAIN PROJECT - FINGERS QUARRY
Overburden Piles

SRK Consulting

Spreadsheet A

Overburden		Map Acres		Revised: 10/27/2008		
Pile Name						
Overburden Pile #1		15.6				
Overburden Pile #2		42.7				
Overburden Pile #3		10.6				
Subtotal		68.9				
Rip/Scarify Acres		39.7		*Benches, overburden pile tops, and gentle slopes only.		
	Contour/Regrade	Growth Media Placement	Rip/Scarify	Fill	Seed/Amendments	TOTALS
Equipment	(1)	(2) & (5)	(3)		(4)	-
Quantity	62,920 CY	55,579 CY (6)	39.7 AC	0 CY	68.9 AC	-
Production Rate	1,042 CY/HR	636 CY/HR	0.70 AC/HR	636 CY/HR	0.7 AC/HR	-
Time Required	60 HR	87 HR	57 HR	0 HR	99 HR	-
Unit Cost						
Equipment	214.64 \$/hr	1,343.31 \$/hr	214.64 \$/hr	\$1,343.31 \$/hr	\$64.50 \$/hr	-
Labor	29.64 \$/hr	207.50 \$/hr	29.64 \$/hr	\$207.50 \$/hr	\$16.56 \$/hr	-
Seed	0.00 \$/ac	0.00 \$/ac	0.00 \$/ac	0.00 \$/ac	\$97.93 \$/ac	-
Cost/Unit Area (\$/ac)	-	-	-	-	\$214	-
Cost/Unit Volume (\$/cy)	\$0.23	\$2.43	-	-	-	-
Equipment Cost	\$12,878	\$116,868.16	\$12,234	\$0	\$6,386	\$148,366
Labor Cost	\$1,779	\$18,052.43	\$1,690	\$0	\$1,640	\$23,160
Seed Cost	\$0	\$0	\$0	\$0	\$6,748	\$6,748
TOTAL COSTS	\$14,657	\$134,921	\$13,924	\$0	\$14,773	\$178,274
Manpower Sub-total		Equipment Sub-total		Material Costs		
Earthwork	\$21,521	Earthwork	\$141,981	Earthwork	\$0	Total Cost (\$/AC): \$2,587
Revegetation	\$1,640	Revegetation	\$6,386	Revegetation	\$6,748	68.9 plan view acres

(1) One D9R Dozer used to blend the overburden piles with surrounding topography - approximately 39 acres includes the quarry backfill areas.

(2) Four scrapers, one Motor Grader, one water truck and one D9R.

(3) D9R. Benches and top of overburden piles will be ripped, 39.7 acres as determined from overburden design.

(4) Broadcast Seeding.

(5) Equals 6 inches of growth media over overburden pile reveg acres.

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CRICKET MOUNTAIN PROJECT - FINGERS QUARRY

Stockpiles

SRK Consulting

Spreadsheet

B

Facility Name		Acres	Revised:		10/27/2008
Topsoil Stockpile #1		3.8			
Topsoil Stockpile #2		2.8			
Total Acres		6.6			
	Earthwork		Revegetation		TOTAL
	Contour/Regrade	Growth Media Placement	Rip/Scarify	Seed/Amendments	
Equipment	(1)	(2)	(3)	(4)	-
Quantity	0 CY	0 CY	6.6 AC	6.6 AC	-
Production Rate	716 CY/HR	636 CY/HR	0.70 AC/HR	0.7 AC/HR	-
Time Required	0 HR	0 HR	9 HR	10 HR	-
Unit Cost					
Equipment	214.64 \$/hr	1,343.31 \$/hr	214.64 \$/hr	\$64.50 \$/hr	-
Labor	29.64 \$/hr	207.50 \$/hr	29.64 \$/hr	\$16.56 \$/hr	-
Seed	0.00 \$/ac	0.00 \$/ac	0.00 \$/ac	\$97.93 \$/ac	-
Cost/Unit Area (\$/ac)	-	-	\$333.18	\$221	-
Cost/Unit Volume (\$/cy)	\$0.00	\$0.00	-	-	-
Equipment Cost	\$0	\$0	\$1,932	\$645	\$2,577
Labor Cost	\$0	\$0	\$267	\$166	\$432
Seed Cost	\$0	\$0	\$0	\$646	\$646
TOTAL COSTS	\$0	\$0	\$2,199	\$1,457	\$3,656
Manpower Sub-total		Equipment Sub-total	Material Costs		
Earthwork		Earthwork	\$1,932	Earthwork	Total Cost (\$/AC):
Revegetation		Revegetation	\$645	Revegetation	6.6 plan view acres
					\$554

- (1) Growth media stockpiles will not be contoured.
 (2) Growth media will not be placed as the existing topsoil will be scarified and seeded.
 (3) D9R Dozer, 1 each.
 (4) Broadcast seeding.

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CRICKET MOUNTAIN PROJECT - FINGERS QUARRY

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Quarries

Spreadsheet C

Facility Name	Acres	Revised:	10/27/2008
Quarry Area	138.0		
Subtotal Acres 138.0			
Earthwork			
	Ripping	Growth Media Placement	Seed/Amendments
Equipment	(1)	(2) (3)	TOTAL (4)
Quantity	124.2 ac	100,188 CY	124.2 Acres
Production Rate	0.70 AC/hr	636 CY/HR	0.7 AC/HR
Time Required	178 HR	158.0 HR	178 HR
Unit Cost			
Equipment	\$214.64 \$/hr	1,343 \$/hr	\$64.50 \$/hr
Labor	\$29.64 \$/hr	207 \$/hr	\$16.56 \$/hr
Material	\$0.00 \$/ac	0 \$/ac	\$97.93 \$/ac
Cost/Unit Area (\$/ac)			
Cost/Unit Volume (\$/CY)	\$350.10	\$2.45	
Equipment Cost	\$38,206	\$212,243	\$11,481
Labor Cost	\$5,276	\$32,785	\$2,948
Seed Cost	\$0	\$0	\$12,163
TOTAL COSTS	\$43,482	\$245,028	\$26,593

Manpower Sub-total	Equipment Sub-total	Materials/Subcontracts Sub-total
Earthwork	Earthwork	Earthwork
Revegetation	Revegetation	Revegetation
\$5,276	\$38,206	\$0
\$2,948	\$11,481	\$12,163
		Total Cost (\$/AC):
		\$2,310.93

(1) Quarry bottoms and benches to be smoothed and ripped with D9R. Acreage equals 90% of selected quarry areas as bench faces will not be reclaimed.

(2) Topsoil placed to a depth of 6 inches.

(3) 631 Scraper, 4 each; 16H Motor Grader, 1 each; 8000 gal Water Wagon, 1 each; D9R Dozer, 1 each.

(4) Total includes quarry berms in following table.

QUARRY BERMS		Fingers	Total
Description		Rk Berm	
(A) Quarry Perimeter Length (ft)		4,500	
Haul Distance (ft)		2,000	
Berm Height (ft)		3	
Berm Crest Width (ft)		1	
Berm Angle (H:1V)		1.3	
Berm Material to Move (cy)		2,450	
Hourly Production (LCY)		469	
Production Time		5.2	
Total Labor Cost		\$310	
Total Equipment Cost		\$3,497	
TOTALS		\$3,806	\$3,806

\$318,909 TOTAL QUARRY RECLAMATION COST

\$41,319 Labor
\$265,426 Equipment
\$12,163 Materials

(A) Includes the length of the energy dissipater shown in Figure 7.

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CRICKET MOUNTAIN PROJECT - FINGERS QUARRY

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Haul/Access Roads

Spreadsheet D

Facility Name		Acres		Revised: 10/27/2008			
Haul Road		2					
Total		2					
		Earthwork			Revegetation		
		Contour/Regrade	Growth Media Placement	Rip/Scarify	Fill	Seed	TOTAL
Equipment		(1)	(2)	(3)	(4)	(5)	-
Quantity		994 CY	1,613 CY (7)	2 AC	0 CY	2 AC	-
Production Rate		1,042 CY/HR	636 CY/HR	0.70 AC/HR	400 CY/HR	0.7 AC/HR	-
Time Required		1 HR	3 HR	3 HR	0 HR	3 HR	-
Unit Cost							
Equipment	214.64 \$/hr	1,343.31 \$/hr	214.64 \$/hr	\$/hr	\$64.50 \$/hr	-	
Labor	29.64 \$/hr	207.50 \$/hr	29.64 \$/hr	\$/hr	\$16.56 \$/hr	-	
Seed	0.00 \$/ac	0.00 \$/ac	0.00 \$/ac	0.00 \$/ac	\$97.93 \$/ac	-	
Cost/Unit Area (\$/ac)		-	-	\$366.50	-	\$220	-
Cost/Unit Volume (\$/cy)		\$0.25	\$2.88	-	-	-	-
Equipment Cost		\$215	\$4,030	\$644	\$0	\$194	\$5,082
Labor Cost		\$30	\$622	\$89	\$0	\$50	\$791
Seed Cost		\$0	\$0	\$0	\$0	\$196	\$196
TOTAL COSTS		\$244	\$4,652	\$733	\$0	\$439	\$6,069
Manpower Sub-total		Equipment Sub-total		Material Costs			
Earthwork	\$741	Earthwork	\$4,888	Earthwork	\$0	Total Cost (\$/AC):	\$3,035
Revegetation	\$50	Revegetation	\$194	Revegetation	\$196	2 plan view acres	

(1) D9R Dozer, 1 each; 16H Motor Grader, 1 each.

(2) 631 Scraper, 4 each; 16H Motor Grader, 1 each; 8000 gal Water Wagon, 1 each; D9R Dozer, 1 each.

(3) D9R Dozer, 1 each.

(5) D9R Dozer, 1 each.

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CRICKET MOUNTAIN PROJECT - FINGERS QUARRY
Road Regrade Volumes

SRK Consulting
Spreadsheet D1

Revised: 10/28/2008

Input Parameters		Outside slope				35.54 degrees		1.4 slope			
Segment Length (feet)	Segment Width (feet)	Section Original Ground Surface Slope	Slope Angle A (degrees)	Crest Angle B (degrees)	Intersection Angle C (degrees)	Original surface segment length (feet)	Fill Triangle Area (1) (square feet)	Segment Acres	Total Segment Width (feet) (2)	Segment Regrade Volume (cubic feet)	Segment Regrade Volume (cubic yards)
Roads:											
435	110	0.0%	0.00	144.46	35.54	55.00	0.0	1.10	110.0	0	0
330	110	5.0%	2.86	144.46	32.68	59.21	81.3	0.90	118.3	26,835	994
								2.00			994

CRICKET MOUNTAIN PROJECT - FINGERS QUARRY

SRK Consulting

Miscellaneous
Spreadsheet E

SUMMARY	Culverts	Maintenance	Monitoring	TOTAL
Equipment	\$315		\$486	\$800
Labor	\$251	\$1,580	\$7,800	\$9,631
Materials		\$395		\$395
TOTAL COST	\$566	\$1,975	\$8,286	\$10,826

A) REVEGETATION, EROSION, AND STABILITY MONITORING AND MAINTENANCE

MONITORING	ASSUMES A RANGE SCIENTIST AT \$82/HOUR FOR 40 HOURS PER YEAR FOR 3 YEARS:			\$	9,840
	Truck / travel cost:	8 hrs travel time per roundtrip from Salt Lake City; 1 trip per yr. for 3 yrs.		\$	486
	Truck cost @ \$20.24/hr (\$17.88/hr rental; \$2.88/hr fuel/lube/wear)				
MAINTENANCE	PERCENTAGE OF OVERBURDEN PILE REQUIRING REVEG:			10%	
	Total Vegetation Acres	Acres to Reveg	Cost Per Acre	TOTAL REVEG COST:	
	172.5	17.3	\$114	\$1,975	
	*10% revegetation based on historical experience at the Cricket Mountain Mine.				
	*Assume 20% of maintenance cost is for materials, 80% is for labor. Assume hand-seeding.				

B) CULVERTS

CULVERT REMOVAL	No. Culverts	\$ equipment/culvert	\$ labor/culvert	TOTAL CULVERT COST:
(2 laborers, 1 operator, and CAT 325 excavator)	2	\$ 157.28	\$ 125.54	\$ 565.63
Assume 4 hours per culvert based on RS Means culvert removal rates for 36" diameter culvert.				

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